AD-A095 729 DAVID W TAYLOR NAVAL SHIP RESEARCH AND DEVELOPMENT CE--ETC F/G 12/2
AUTOMATIC VEHICLE SCHEDULING (AVS) PROGRAMMER'S INSTRUCTION MAN--ETC(U)
FEB 81 R WINCHELL, R MELTON, M NATRELLA

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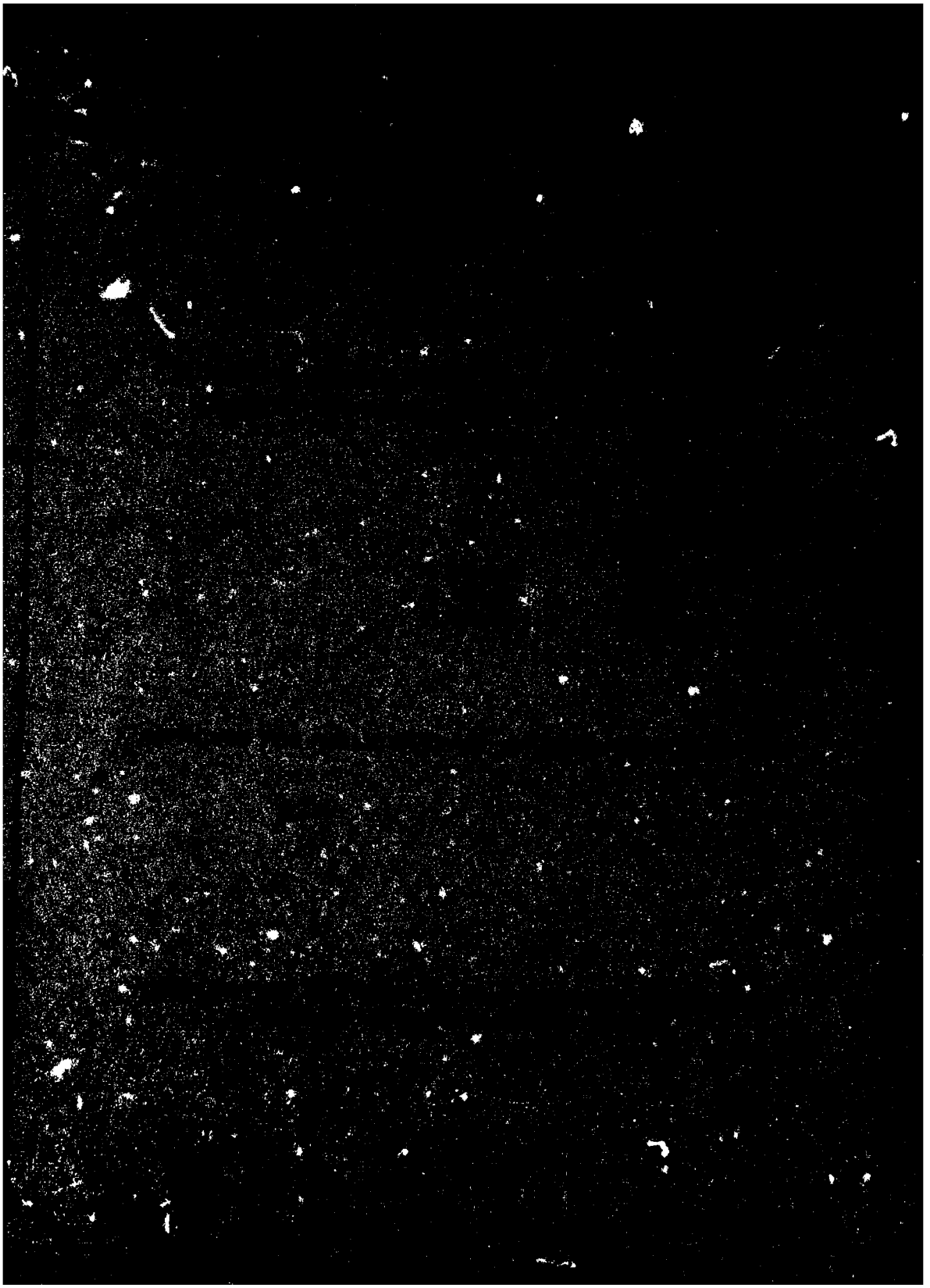

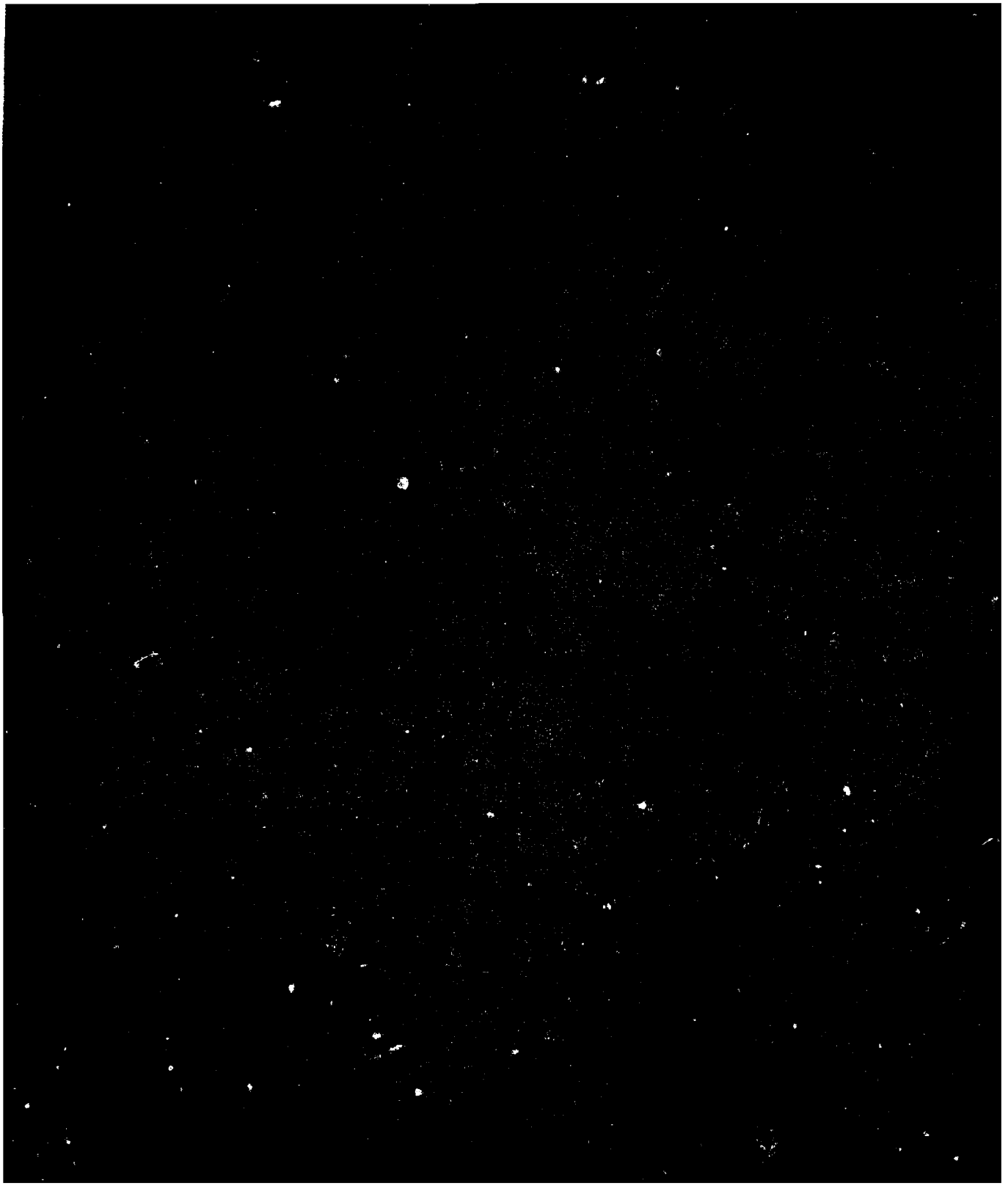

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REPORT DOCUMENTATION PAGE

READ INSTRUCTIONS BEFORE COMPLETING FORM

1. REPORT NUMBER: DTNSRDC-81/017
2. GOVT ACCESSION NO.: AD-A095 729
3. RECIPIENT'S CATALOG NUMBER:

4. TITLE (and Subtitle): AUTOMATIC VEHICLE SCHEDULING (AVS) PROGRAMMER's INSTRUCTION MANUAL FOR THE BURROUGHS B3500 COMPUTERS
5. TYPE OF REPORT & PERIOD COVERED: Final
6. PERFORMING ORG. REPORT NUMBER:

7. AUTHOR(s): R. Winchell, R. Melton, M. Natrella
8. CONTRACT OR GRANT NUMBER(s):

9. PERFORMING ORGANIZATION NAME AND ADDRESS: David W. Taylor Naval Ship Research and Developoment Center, Bethesda, Maryland 20084
10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS: Work Unit 1800-007

11. CONTROLLING OFFICE NAME AND ADDRESS:
12. REPORT DATE: February 1981
13. NUMBER OF PAGES: 197

14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office):
15. SECURITY CLASS. (of this report): UNCLASSIFIED
15a. DECLASSIFICATION/DOWNGRADING SCHEDULE:

16. DISTRIBUTION STATEMENT (of this Report)

APPROVED FOR PUBLIC RELEASE: DISTRIBUTION UNLIMITED

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

AVS, warehousing, scheduling, straddle trucks, transporters, industrial tractors, NSC

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

Automated Vehicle Scheduling (AVS) is a software package designed to assist in scheduling palletized cargo delivery to warehouses in a Navy Supply Center. The package consists of two scheduling programs, which schedule regular and emergency orders, respectively, and a transaction history file update/report program.

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ABSTRACT

Automated Vehicle Scheduling (AVS) is a software package designed to assist in scheduling palletized cargo delivery to warehouses in a Navy Supply Center. The package consists of two scheduling programs, which schedule regular and emergency orders, respectively, and a transaction history file update/report program.

ADMINISTRATIVE INFORMATION

This study was authorized by the Naval Supply Systems Command with funding under Task Area 53/531/091.

INTRODUCTION

Automated Vehicle Scheduling (AVS) is a software package designed to assist in scheduling palletized cargo delivery among warehouses in a Navy Supply Center (NSC). The package consists of two scheduling programs, AVS1 and AVS2, which schedule, respectively, regular and emergency orders, and a transaction history file update/report program, AVS3. They are written in FORTRAN and are designed to run on Burroughs B3500 computers at NSC, Charleston, S.C. and at the Fleet Material Support Office, Mechanicsburg, PA. An earlier version was designed for the CDC 6600 computer at DTNSRDC.

AVS can schedule up to 99 orders totalling about 2000 pallets among as many as 99 warehouses. Deliveries and/or pickups are made by as many as 50 vehicles of four general types: straddle trucks, transporter vehicles, tractor trailers, and industrial tractors. Routes are built to "maximum" efficiency within the limitations of the algorithm used.

AVS2 uses the routes prepared by AVS1 to schedule servicing of emergency orders placed during the regular daily routine. An emergency order can include from 1 to 99 pallets; it can preempt regular orders if the dispatcher desires; it can be handled by a single vehicle type or by a mix of vehicles; finally, the vehicles selected to service it may be those used for regular orders, a subset of these, vehicles previously

unused, or any combination of these vehicles. As many as 99 emergency orders may be considered in the same AVS2 run.

For AVS to be successful, the programs must be easily usable by dispatch personnel who have had minimal computer training. In addition, the scheduling programs must execute rapidly to assure fast response to orders. For these reasons the AVS programs are interactive, tutorial, and corrective, using cathode ray tube (CRT) terminals connected to the B3500. Program procedures, execution instructions, and output file storage are simple. Data are requested from the user by the Information Retrieval System (SINR) and inputs are checked for validity by a COBOL driver program, AVSIN1. Instructions are available to the user in frame form displayed at the CRT terminal. Schedules are generated only after the user has checked the correctness of the data.

BACKGROUND

Since the impetus for undertaking the AVS project came from NSC Charleston, the AVS programs described here address operations at that installation. A brief description of Charleston's local delivery procedures is given in this section.

NSC Charleston includes 78 pick-up/delivery sites and eight piers, plus six off-base sites (Table 1). Twenty or more of these are used in a typical half-day's schedule. The dispatch operation is run from building 1078. (A map of the Charleston complex is given in Figure 1; the warehouses are listed in Table 1.)

Orders for palletized cargo movement fall into three priority classes. Group 3 orders are telephoned to the dispatcher twice a day: at 1 00 and 1500 hours. Group 2 and Group 1 are priority orders requiring service within 8 hours and 4 hours, respectively. They may be called in at any time, but in practice are usually phoned in at the same time as Group 3 orders. Orders are ready for shipment at the warehouses when the dispatcher is called to request transportation. At present the dispatch supervisor prepares the vehicle schedules from the order list using his knowledge of the base layout; there is no documented formal procedure. The vehicles are radio dispatched to service these requests.

However, there is additional cargo movement which is not handled in this way. At certain warehouses the high volume of cargo that is routinely shipped/received is moved by vehicles assigned exclusively to those locations. These movements will not be scheduled by AVS initially.

Orders are serviced by four types of vehicles: straddle trucks, transporter vehicles, conventional tractor trailers, and industrial tractors. These vehicles will be designated in the remainder of this report by the abbreviations ST, TR, TT, and IT, respectively. These vehicles are distinguished by their operational characteristics, such as highway speed, load time, manner of loading, and the skills and ratings of the drivers who operate them.

TT's carry from four to fourteen pallets, are capable of highway speeds, but are relatively slow at loading and unloading. They must be

backed up to a loading platform and loaded by forklifts. TT's are the only vehicles which service the off-base sites.

TR's carry either ten or twelve pallets, are somewhat slower than TT's, and are more efficient at loading. They drive up to a loading platform, the operator's cab swings out of the way, the height of the truck bed is adjusted, and pallets are loaded onto a gravity conveyor which delivers them to a roller bed in the truck. When gravity conveyors are not available at a site, forklifts must be used instead.

ST's carry five or seven pallets, are slower than TT's or TR's on the road, but are the most efficient at loading. Pallets are aligned at the pick-up site; the ST lowers a set of lifting rails which fit into channels on the sides of the pallets; the ST then lifts the pallets and drives off. The procedure is reversed for unloading. ST's can service up to three warehouse origins per route segment, i.e., loading/unloading cycle.

IT's carry up to fourteen pallets, are slower than TT's, TR's, or ST's on the road. Loading and unloading are the same as for TT's. IT's are for use within the complex only.

The algorithm places minimum load requirements on each vehicle type for route assignment. These requirements are: ST, 3 pallets; TR, 8 pallets; TT, 14 pallets; and IT, 8 pallets.

TABLE 1 - NSC CHARLESTON WAREHOUSES SERVICED BY AVS
LISTED BY GROUP AND NUMBER WITHIN GROUP

Group		
Num	Name(s)	Activity
NORTH		
1	191	NSC
2	1601a	"
3	1601b	"
4	1602	"
5	1603	"
6	1604	"
7	1605	"
8	1606	B279
9	1621	NSC
10	1622	"
11	1628	"
12	A	"
13	1620	"
14	1157	"
CENTR		
15	SM,45	Serve Mart
16	46	6th Nav Dist
17	53C	"
18	64E	NSC
19	64W	"
20	66E	"
21	66W	"
22	67E	"
23	67W	"
24	198	"
25	1078	"
26	1127	"
27	1138	"
28	56	"
29	49	"
30	SF	"
31	SFR	"
NSYN		
32	2	USNSY
33	3	"
34	5	"
35	8	"
36	35	"
37	43C	"
38	44	"
39	59	"
40	223	"

Group		
Num	Names(s)	Activity
WEST		
41	1502	NSC
42	1503	"
43	1507	"
NSWT		
44	80	USNSY
45	177	"
46	1143	Spec Serv
47	1199	USNSY
	NSYC	
48	98	NSC
49	187	USNSY
50	216	"
51	1175	"
52	1169	"
53	1171	"
54	1172	S.O.A.P.
55	1173	NSC
56	1174	USNSY
57	218	"
	NSYS	
58	X10	AS17
59	193	NSC
60	224	USNSY
61	L	PIER
62	M	"
63	N	"
64	P	"
65	Q	"
66	R	"
67	S	"
68	T	"
69	X20	
SOUTH		
70	30	RTC1
71	43S	not used
72	61	FBMTC
73	84	Comm.Ctr.
74	202	RTC1
75	646	USNS
76	647	"
77	655	Comm.Store
78	656	Navy Ex.
79	52	"

TABLE 1 (continued)

Group		
Num	Name(s)	Activity
MCRFT		
80	1	Mine Craft
81	7	"
82	16	"
83	23	"
84	26	"
85	53S	"
X54		
86	X54	Comm.Ctr.
OFF BASE		
87	ABASE	Air base
88	NWS	Nav Weap Sta
89	DEYTN	Deytens SY
90	BRASW	Braswell SY
91	CSNWS	ComStoreNWS
92	NMEDC	Nav Hosp

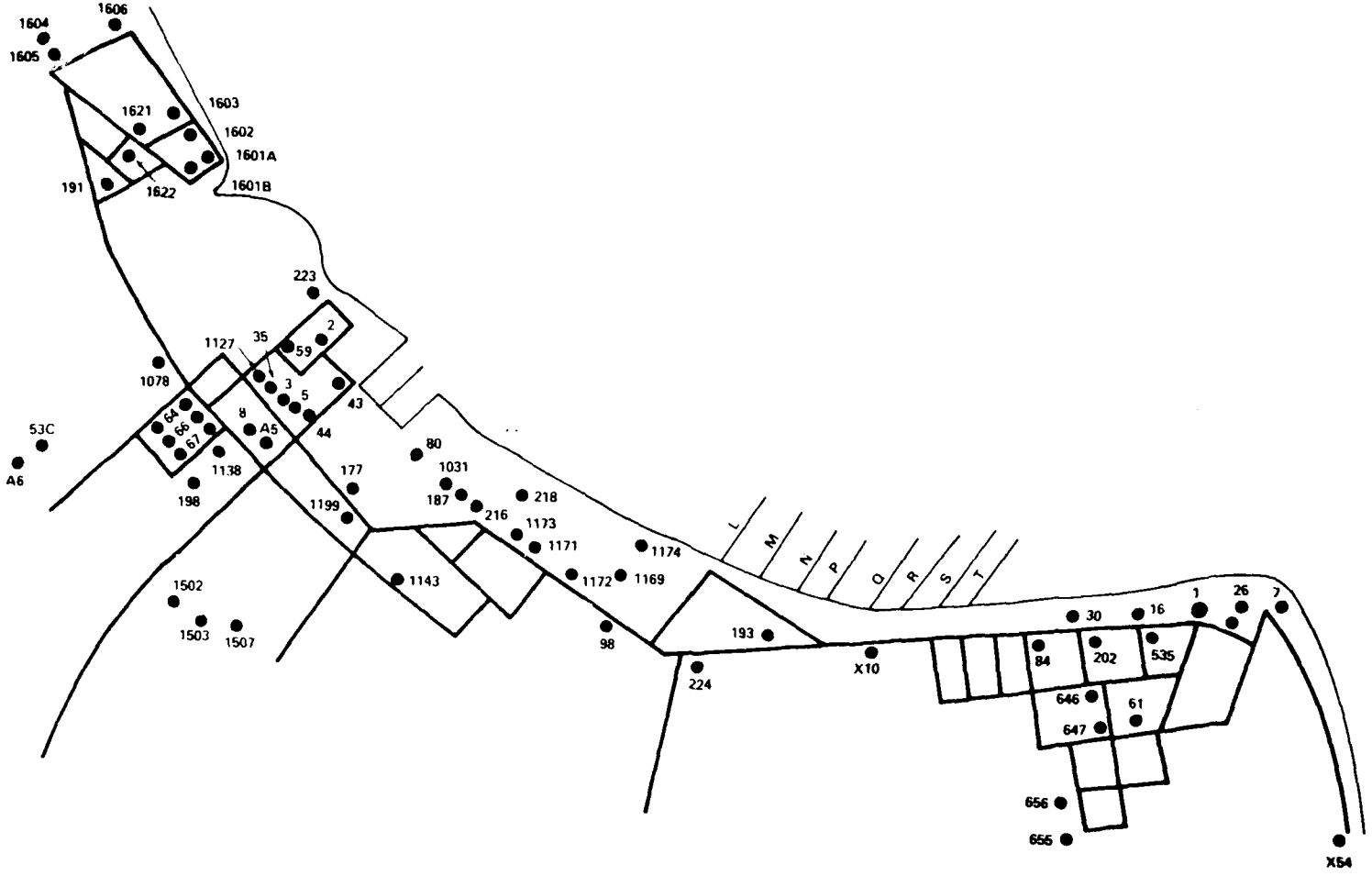


Figure 1 - Map of Charleston Navy Base - AVS Serviced Warhouses

AVS1 - REGULAR ORDER SCHEDULING

Regular order scheduling takes place in four phases. The first phase is interactive data entry from a remote CRT terminal (handled by the SINR Information Retrieval System available on the B3500 computer). In the second phase (subroutine AVSN2) the program examines the input orders individually and sorts them to reduce vehicle order selection time. In the third phase (subroutine ROUTE) the four vehicle-type order lists are assembled into vehicle routes. The last phase converts the vehicle route arrays into usable printout (subroutine TCARP). Figure 2 gives the AVS System Flowchart. The combined program, AVS, which consists of AVS1 and AVS2, uses 84 kilo digits (KD) of core locations.

INPUT

When procedures specified in the User's Manual (Appendix A) are followed, the data input to AVS1 is accomplished interactively from a remote CRT terminal. The user may enter the following data:

Orders. Orders are entered by listing the order sizes and originating and destination warehouses. Entries are made by "filling in the blanks". Data correctness messages are displayed on the CRT screen.

Vehicles. Vehicles are entered by listing the vehicle type, capacity, and maximum route duration. Omission of either capacity or maximum route duration for any vehicle will cause the algorithm to substitute default (built-in) values.

Begin Time. The beginning time for the schedules must be entered. The program uses 24-hour clock time.

Route Length. A maximum value for route duration in minutes is entered. This entry will replace a default value of 480 minutes. This route length does not supersede the value which is specified in the vehicle entry.

SINR's COBOL Driver Routine, AVSIN1, checks the input data for validity. An order's origin and destination warehouses must match a built-in list of warehouse names. Input numeric data (e.g., order size, times, vehicle capacity, and route duration) must be within specified ranges. The corrected data are made available to AVS through the VS2IN file. After all input has been entered satisfactorily, AVSIN1 will execute AVS.

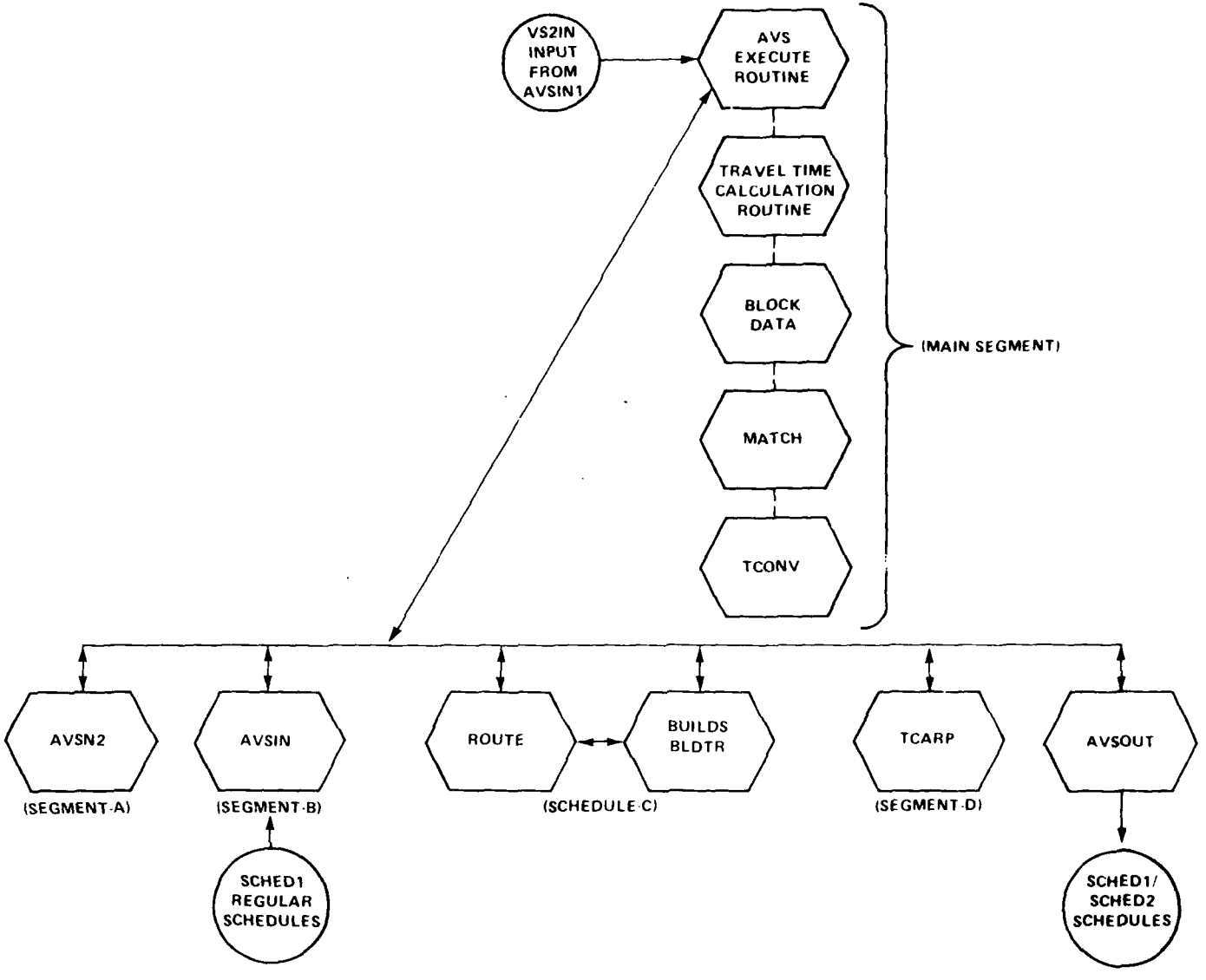


Figure 2 - AVS System Flow Chart

METHOD and ALGORITHM

Route building is accomplished by subroutines ROUTE, BLDTR, and BUILDS. The schedules for ST's are built first, then for TR's, TT's, and finally for IT's. The order of schedule building for the four vehicle types may be changed to fit the needs of the user. The algorithm operates on the sorted lists of orders. In the following discussion the ST routes are built first, then the variations used in TR, TT, and IT route building.

The list of orders is scanned to determine the combination of orders which will, if serviced by a single ST, provide the greatest time savings (or least time cost) over the situation in which each order is serviced by a separate truck. All time estimates pertain to warehouse areas, rather than to individual warehouses. There is almost always a time savings involved in joining two or more orders in this manner. However, to prevent excessive order joining and over-utilization of individual vehicles, a least time savings restriction was added to the algorithm. Since joined order routes are assigned to vehicles first, the least time saving restriction reduces the number of joined orders and allows the assignment of single order routes to available vehicles. If the minimum load requirement for the vehicle is not met, order segments will be joined.

Having selected the best set of orders to start an ST's route, the algorithm examines the remaining orders in the list for that single order which, if joined to the route, results in the least time cost over servicing the order separately. As in the starting case the limit on time applies. The new order is placed at the end the existing route, since examining intermediate positions along the route would be too time consuming and the coding would be too complex.

The algorithm continues in this manner, adding orders to the end of the previous route, until the route time limit for the vehicle precludes further additions, or until the pool of unassigned orders is exhausted. In the latter case the algorithm proceeds directly to consideration of the TR vehicles. In the former case the next ST route is

begun, using the same method. ST routes are built using a "first on, first off" strategy.

TR, TT, and IT building is exactly like ST route building and requires no additional elaboration. Leftover orders from TR route building are passed to the TT's and leftover TT orders are passed to IT's in the same manner that leftover ST orders are passed to TR's. Figure 3 shows beginning pairs that may be serviced by all vehicles. Figures 4 through 6 illustrate order assignment for each vehicle type. Routes for TR's, TT's, and IT 's are built using a "first on, last off" scheme.

Since TT's are the only vehicles equipped for highway travel, they alone service the six off-base activities.

Route building ceases when all IT routes have been built. If any orders are still unserviced, they are printed out so that the the dispatcher can schedule them at a later time. They may be scheduled later as "emergency" orders using program AVS2, they may be postponed to the next shift, or they may require special scheduling without the use of AVS.

PROGRAM OUTPUT

Schedule output from AVS1 consists of a summary of the input data and the schedules for the individual vehicles. Each schedule gives the vehicle name, capacity, route starting time, and dates in a header; a list of scheduled stops specifying site, time, pallets picked up or delivered, reference order number, and approximate stay time at the site; and a trailer of finishing time and location, time still available, and number of pallets moved. AVS1 also creates a system schedule file, SCHED1, to be used by AVS2.

The coding for schedule printout is quite complex (see Special Techniques section). Changes to this coding should be made only after a thorough study of the programming details covered in Appendixes A and B.

+ PICK-UP
- DELIVERY
ORDER
WAREHOUSE
· DIRECTION

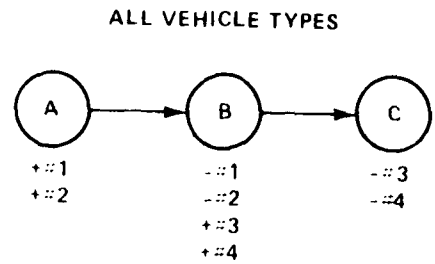


Figure 3 - All Vehicle Types, Order Allocations

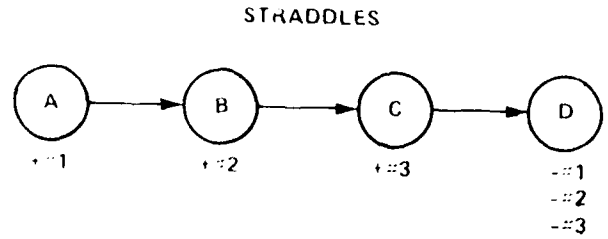


Figure 4 - Straddle Order Allocations

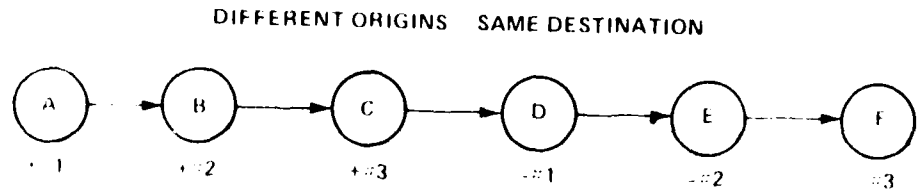


Figure 5 - Transporter Order Allocations

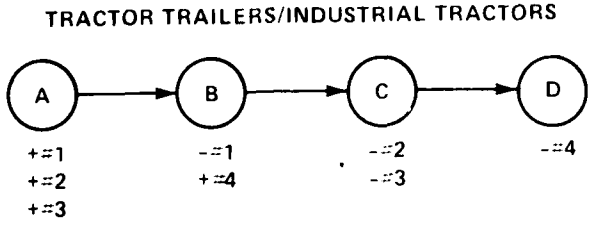


Figure 6 - Tractor Trailers/Industrial Tractors Order Allocation

AVS2 - EMERGENCY ORDERS SCHEDULING

The emergency order program AVS2 comprises three phases; data entry (AVSIN1-Appendix C), order scheduling (Subroutine Route), and schedule printout (Subroutine TCARP). These phases are described in the following paragraphs. Figure 2 gives the AVS2 system flowchart as a subset of AVS.

INPUT

AVS2 also uses SINR, and data items are entered by "filling in the blanks" as specified by the selected frames. AVSIN1, a SINR COBOL driver routine, consolidates the data and makes the results available to AVS2. The corrected data are passed to AVS2 on file, VS2IN. When data entry is complete, AVSIN1 executes AVS. Route data from the previous set of schedules, whether generated by AVS1 or by an earlier run of AVS2, are used by the program along with the current emergency order data as entered at the terminal. The following data are entered interactively:

Orders. The order origin, size, and destination are entered. Origin and destination are checked against a list of warehouse designations. Order size must be a numerical entry in the range 1-99 pallets. Up to 99 orders may be entered for emergency scheduling; if more than 99 are input, only the first 99 are retained.

Vehicles. A considerable choice of vehicles to service the emergency order is given to the user. All vehicles made available when the schedules were created by AVS1 (or augmented by earlier AVS2 runs) may be used; any subset of these may be chosen; or new vehicles may be selected. For new vehicles, capacity and maximum route duration may be specified; otherwise, default (built-in) values for capacity and maximum route duration are used. New vehicles chosen by the algorithm to service the order are added to the available vehicles list for the next use of AVS2, but if a vehicle just added by the user during data entry is not selected by the algorithm, it does not join the list.

Time. The time of the emergency order is input. This time is the basis on which the existing schedules are examined to determine vehicle availability. Consequently, sufficient lead time should be allowed to permit the program to execute and the dispatcher to notify the selected driver of his change in route.

Date. It is possible during AVS2 to change the date stored in the AVS1 schedules.

Bump Option. A "bump" option can be exercised to allow the servicing of emergency orders before regular orders.

METHOD AND ALGORITHM

AVS2 examines the existing vehicle schedules and determines which vehicle or vehicles should service an emergency order. There is a fundamental assumption that the vehicles are, in fact, following the computer generated schedules fairly closely. This assumption allows AVS2 to work with schedule data rather than with real time data.

The criterion for determining which vehicle(s) service an emergency order is quite simple, but complexities in the coding arise from a number of options designed to make the algorithm more flexible, and from the rather complicated method of storing the schedule data (linked list technique). According to the criterion, the emergency vehicle selected is the one which can pick up the emergeny order the soonest, subject to restrictions imposed by the algorithm options.

The "bump" option affects this criterion. Under the bump option the user may allow vehicles to exceed their allotted maximum route duration. The default case for this option is not to permit this. Therefore, a vehicle which could service the emergency soonest would not be chosen if such an action meant that its regular route would not be finished on time. This action is altered by specifying the bump option during interactive data entry (see above and Appendix A, User's Manual). The term "bump" signifies that delivery of regular orders would be interrumpted to handle the emergency. When time is clearly critical, specifying the bump option will enable the emergency order to receive the fastest possible service. If the bump option is not specified, and if the vehicles under consideration all have relatively full schedules, the program may inform the user that no vehicles are available to service the order.

An important feature of AVS2 is that the user may specify the vehicles to be considered, regardless of which vehicles were made available to the AVS1 algorithm. That is, the same vehicles may be used

as were used for the previous schedules; or a subset of those vehicles may be used; or additional vehicles may be specified. This gives the dispatcher considerable control over the manner in which the program schedules the emergency order. As an extreme example, the user could specify a single truck which was already in use, together with the bump option, to force the algorithm to fit the emergency into that vehicle's schedule.

Several points about the AVS2 algorithm need to be mentioned: First, the emergency order algorithm may be used any number of times during the processing of the AVS schedules. At the conclusion of each emergency run, the schedules are updated for use by the next run.

Second, but related to the first point, when the schedules are being searched for the placing of a new emergency order, no vehicle servicing a previous emergency order is available for the new order until the previous order is delivered. Emergency orders have a single priority, and are filled on a first come, first served basis.

This leads to a third point: emergency orders should be run in the order in which they are placed. Failure to do this may give erroneous results. Also the program will take a few minutes to run and print out, and this should be considered in specifying the start time for an emergency order.

Fourth, the actual updating of the schedules is not done automatically within the AVS2 program; consequently, if the schedules printed at the remote terminal do not satisfy the user, he may change options, vehicles, or even order data and rerun the program. Previous schedules may be saved or discarded by simple file handling commands given in Appendix A. The schedule may be modified using AVS3, Update Program. Detailed flowcharts and coding descriptions are found in the Appendixes.

PROGRAM OUTPUT

Schedule output for AVS2 is straightforward. A summary of the input data is provided, then a vehicle availability table. Any vehicles which cannot be used are listed and the actual vehicle(s) chosen is (are) given. Finally the new schedules for the chosen vehicle(s) are printed, following the same format as in AVS1.

SPECIAL TECHNIQUES

Several techniques used in the AVS programs will be described here to help in understanding the program coding. All the techniques were used to reduce execution time and core requirements so that the programs could run on the rather limited Burroughs B3500 computers in use by Navy Supply Centers. The penalty for the gain in efficiency of the programs is increased program complexity. Three techniques have to do with the calculation of travel times between warehouses; two are general data storage techniques used to reduce sort times in the AVS algorithms.

TRAVEL TIME TECHNIQUES

The AVS programs were set up to service up to 99 warehouses, and the test facility (NSC Charleston) has, in fact, 92 sites. The algorithms make frequent use of the travel times between sites. The times differ for the four vehicle types, giving more than 15,000 intra-activity time measurements. The prohibitive cost of storing such a collection of data demands that this figure be reduced to a more manageable level; it is this problem that the three techniques mentioned address.

The major reduction in the time array sizes is achieved by grouping the warehouse sites; each group of warehouses in close proximity is considered a single site (area). Figure 1 shows the groupings of the Charleston sites. (These groupings reflect some functional as well as geographic differentiation). The travel times between warehouses within an area are taken to be constant (two minutes).

A further reduction in the time array sizes is gained by considering the six off-base sites separately. These sites are serviced only by TT's and all movements take place between the main base and the sites; i.e., there are no movements between off-base locations. The number of measurements necessary to represent travel to the off-base sites is thus reduced to six.

The final reduction in array size is based on an assumption of symmetry in the travel time matrices; i.e., the time to travel from site A to site B is the same as the time to travel from site B to site A. This assumption is justified by actual travel time data collected at Charleston.

Applying these three techniques reduced the arrays from more than 15,000 to 150 storage locations, with only a slight increase in the procedural code generated and with little or no decrease in the accuracy of the schedules.

LINKED LIST TECHNIQUES

The linked list method of data storage is one of several which were tried in various versions of the AVS programs; it is demonstrably faster than the sorting method and uses considerably less core than the duplicate arrays method, both of which are discussed here.

Two sets of data arrays are used in the programs: one set contains information about the orders and the routes to which they belong; the other set contains information about the vehicles used. In both cases the information contained in the arrays is initially stored in a particular sequence. Later the same information is used in a different sequence. For example, the orders generated by AVS1 are stored in the sequence in which they are input at the remote terminal. They are then scanned repeatedly and assembled into the final vehicle schedules.

The problem is how to re-organize the data in these arrays from their initial sequence to their final sequence. The first and most natural method is actual physical re-organization of the data. The advantage of this method is that the final arrays are easy to process, either by computer or the human mind. For example, the orders processed by vehicle #1 would appear first in the final arrays, and would appear in the order in which the vehicle would service them. There are two ways in which this physical re-organization can take place: through the use of duplicate arrays or by sorting the original arrays.

In using duplicate arrays the first set of arrays is examined and the appropriate element is selected, stored in the second set of arrays, and deleted from (or marked as processed in) the original arrays. The obvious disadvantage to this method, particularly when large amounts of data are being processed, is that the memory requirements of the program are doubled.

The second method of physically re-organizing data is by sorting. The initial arrays are examined; the chosen element is selected and physically moved to the first position in the arrays; the remaining items in the arrays are shifted to make room for it. This process eliminates the need for duplicate arrays and their large memory requirements; however, sorting is a time consuming process when the arrays involved are large.

Both these methods for physical re-organization of data were used in early versions of AVS software, but the constraints of time and space made them unacceptable.

A common method of processing large amounts of data is that of embedded links; this technique is used in several of the large data base management systems now commercially available. In this technique a sequence of data items in a large set of data arrays is linked together by providing an array of pointers or links. The pointer associated with a data element gives the address of the next datum in the sequence. A pointer external to the arrays gives the address of the first element in the sequence, the link variable associated with that element gives the address of the second element in the sequence, etc. The time constraints of sorting, where n^2 movements are required to sort n elements, are not encountered. The introduction of an additional array of pointers does not usually involve a significant increase in storage, since the data elements being sorted are usually made up of corresponding components of many parallel arrays (or the addresses of indices in the pointer array are much smaller than the items which they label).

When the initial duplicate array versions of AVS were reprogrammed using sorting techniques, the size of the program decreased by 50 percent and when further reprogramming introduced the linked list techniques, the time of execution for a relatively large test case (99 orders) was decreased to about 25 per cent of its previous value.

The three methods of data restructuring are illustrated in Figures 7, 8, and 9.

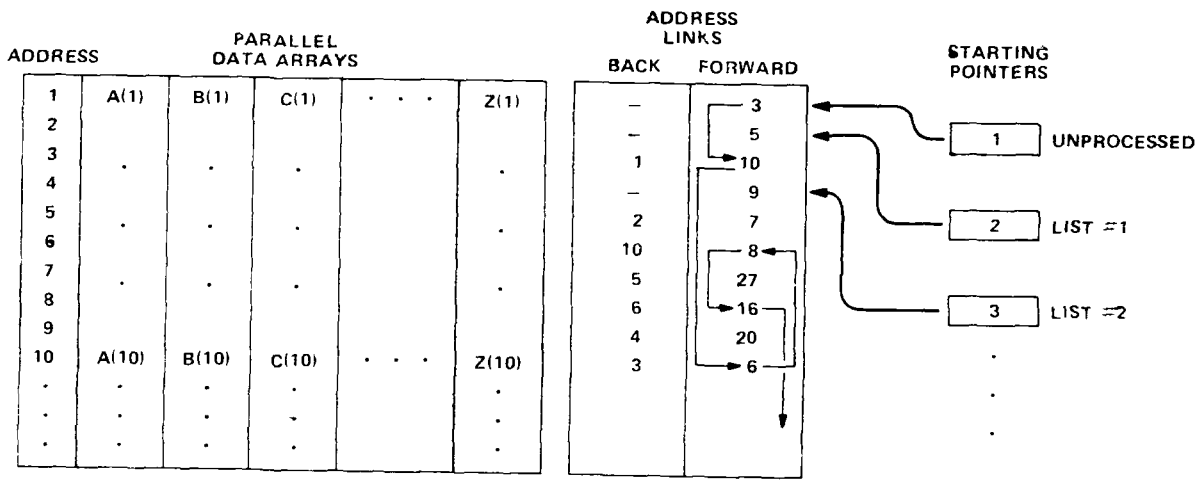


Figure 7 - Methods of Data Storage, Duplicate Arrays

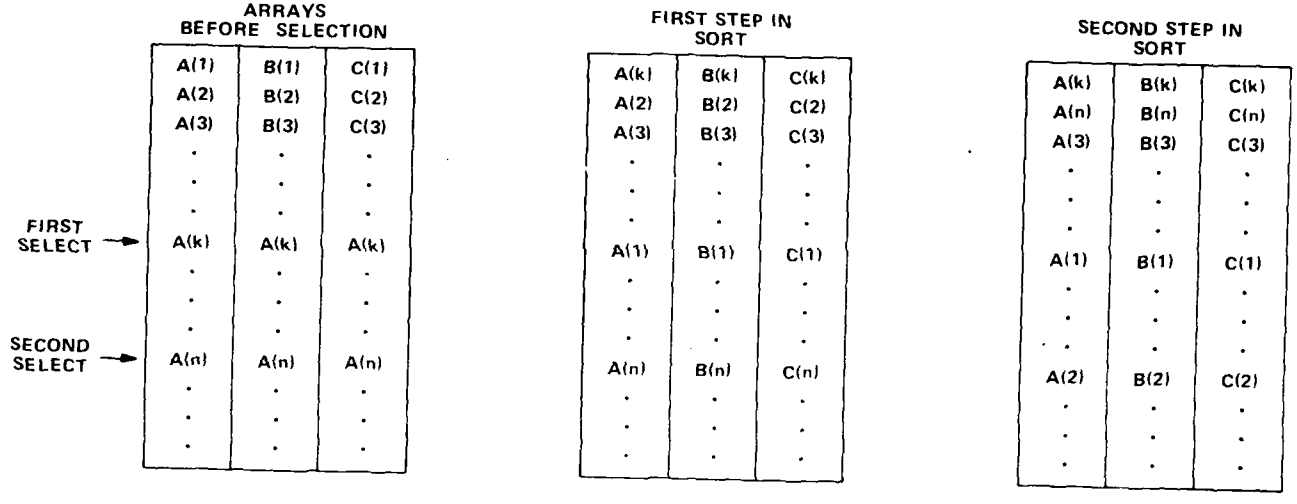


Figure 8 - Methods of Data Storage, Sequential Sort

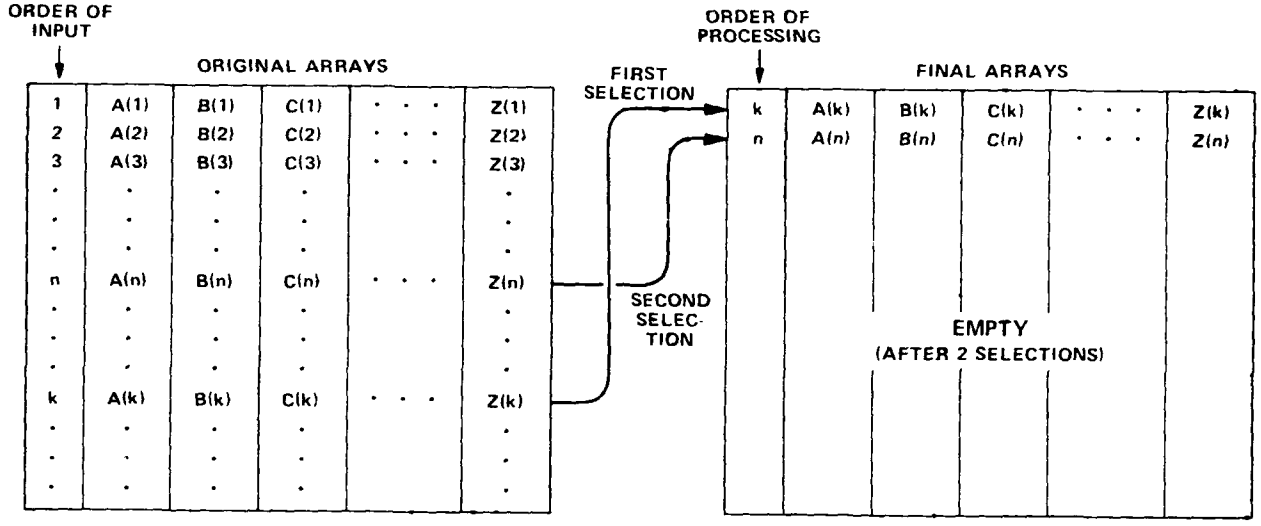


Figure 9 - Methods of Data Storage, Linked Lists

A major advantage to the linked list method of data organization is that it speeds access to the data. For example, rather than searching an entire array for an item which is in a specific vehicle route, only the items in the route need be examined. The data examination process is made more efficient in the AVS case because there is a separate linked list for unprocessed orders, i.e., those orders not yet assigned to a vehicle route. As routes are built, orders pass from the unprocessed linked list to a specific vehicle's linked list. Thus each successive search of the unprocessed orders takes less time.

The savings in space and time of the linked list system must be paid for by increased complexity of the program code.

A separate linked list must be maintained if the arrays are to be searched in reverse order, or if items are to be inserted in a list. Thus two link arrays must usually be specified to determine a linear chain of items. Examination of the coding for AVS, particularly subroutine TCARP, shows how complicated the coding can become using the linked list technique.

DATA PACKING

Because of the limited magnitude of order size and the number of warehouses considered, it was felt that all order information could be placed, "packed", in one data location rather than in three. The array INFO represents all order information, and each entry has the following format:

INFO Word Configuration

Order allocation indicator +, unassigned -, assigned	Origin warehouse number	Destination warehouse number	Order size
1 digit	2 digits	2 digits	2 digits

Data packing also reduces the number of internal sorts by listing one data element rather than three.

AVS3 - HISTORY/UPDATE PROGRAM

The AVS history file is created from the schedules produced by AVS1 and AVS2. The quantities of orders scheduled for delivery are accumulated by originating warehouse, destination warehouse, and truck name. This file is maintained by AVS3.

AVS3 is the set of subroutines used for creating, maintaining, and reporting records in the AVS history file.

File Description

The history file is sequentially organized, with records sorted by START DATE with the earliest date first.

Record Structure

The record for the history file is 1424 bytes long. Each record is uniquely identified by two of the following three fields:

START DATE
END DATE
SHIFT

The Start Date is the earliest date covered by the data in the record. Similarly, the End Date indicates the end of the period of time covered by the dates. When the two dates are unequal, the shift is set to zero and not used. For equal dates, the shift may or may not be zero. A non-zero shift indicates that the data in the record are for a single shift; a zero shift indicates a record with data accumulated over many shifts. Records for a single shift are created from the SCHED1 file produced by AVS1 or AVS2. Before the new record is inserted in the file, a copy of the mark in the SCHED1 file is made for the record, since AVS2 increments the mark by one when it updates the schedule with an emergency order. This enables AVS3 to determine whether the SCHED1 file used is a newer generation than the file which originally created the record.

Record Creation

AVS3 creates new records in the history file using the schedules generated by either AVS1 or AVS2. These schedules are contained in the SCHED1 file. AVS3 first reads the SCHED1 file. It then reads the history file for the same date and shift as the SCHED1 file. If a record

is found with the specified date and shift, the trailer mark on the history file record is compared with the mark in the SCHED1 file. If the mark on the history file record is the same as the mark on the SCHED1 file, the SCHED1 file created the history file schedule record. If the history file trailer mark is less than that in the SCHED1 file, the incoming SCHED1 file is of a more recent generation than the one that created the record. In this case, as well as when a record is found with the specified date and shift, a new record with the date, shift, and trailer mark of the SCHED1 file is created; otherwise, processing is terminated.

Assuming the record can be added to, or replaced by an existing record on the history file, AVS3 then reads through the SCHED1 schedule, accumulating the number of pallets in each scheduled order by originating warehouse, destination warehouse, truck name, and type of order (regular or special, i.e., emergency). When all scheduled orders are exhausted, AVS3 accumulates the number of pallets of each unscheduled order by originating and destination warehouse. The sum of unscheduled pallets is designated as backlog. The record is placed in its proper position in the history file, and a report of the new record is generated.

Update

When an update is made with input from the terminal, AVS3 searches the history file for the record with the specified date and shift. If a record is found which either has the specified date and shift, or spans a period of time which includes the specified date, the record is updated. If the specified record is not in the file, a message is printed and the next update record is read. If several update records are read which update the same record, the record is left in memory. The file is then searched for the new record. When the program is terminated, the file is updated and the last record updated is printed.

Record Merge

The merge function of AVS3 is used to reduce the number of records in the file by consolidating a number of records into one. Merges are performed on the file by defining the period of time from which the individual records are to be taken. AVS3 reads through the date span. It then continues to read the file, accumulating entries from the subsequent

records in the first record read. When the end of the specified date span is reached, AVS3 updates the Date fields in the original record to indicate the period of time to which the data apply. The file is then copied, with the new record inserted in its proper place. At the conclusion of the run, a report of the new records is generated. Figures 10, 11, and 12 show record entry, consolidation, and update.

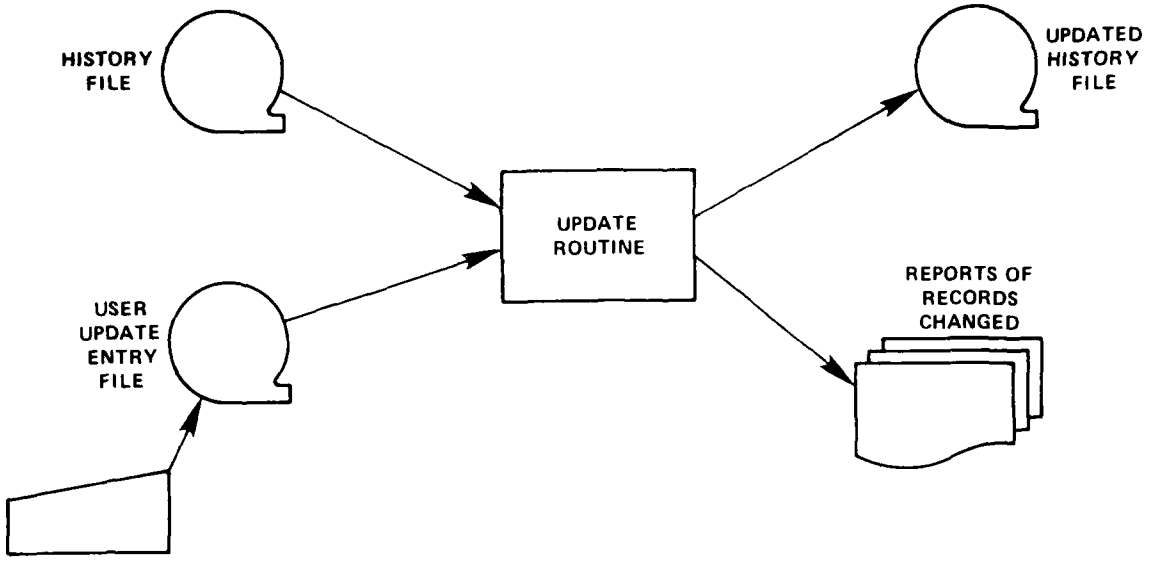


Figure 10 - Individual Entry Update

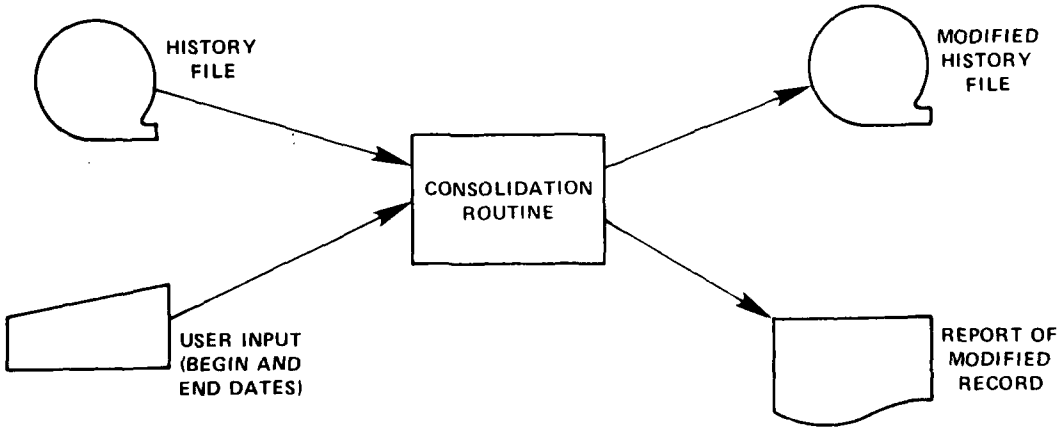


Figure 11 - Record Consolidation

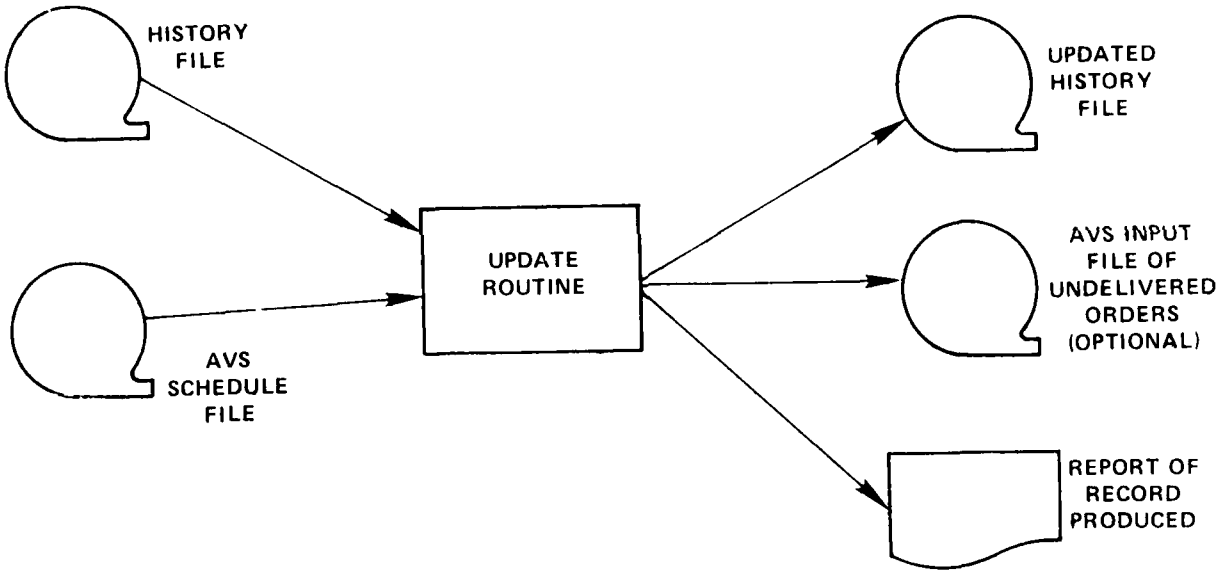


Figure 12 - Update From AVS Schedule

INPUT

AVS3 uses SINR, and data entry is accomplished by "filling in the blanks" as specified by the selected frame. AVSIN1, a SINR COBOL driver routine, consolidates the data and makes the resulting file, VS3IN, available to AVS3. When data entry is complete, AVSIN1 executes AVS3.

Route data from the previous set of schedules may be modified or updated and placed on a master file. The function number is specified as data and entered interactively: Figure 13 shows one AVS3 frame.

FUNCTION	ACTION
1	Update the history file using the schedule produced by AVS1 or AVS2
2	Update or add specific entries to the history file
3	Merge two or more records to create an aggregate of the records in the history file, replacing the old records with the new one
4	Produce a report of either an individual record or an aggregate of several records

PROGRAM OUTPUT

AVS2 produces a Summary Report of the history file for the date and shift specified. This report gives cargo transfer statistics by warehouse, indicating the number of pallets delivered, shipped, and backlogged.

For most functions of AVS3, the program will produce two outputs. One will be the history file with the new or updated record. The other output is a report of the record as created or updated. The report includes:

- the date of the updated or created record
- the shift, if applicable
- the warehouse from which the pallets were sent
- the receiving warehouse

FRAME A07

```
(FRM #A07                AUTOMATED VEHICLE SCHEDULING - HISTORY FILE INPUT
DOCID  [  1  ]
FRAME  [ 2 ]  (ENTER 7)  (FUNCTION [ 3 ](1-UPDATE FROM AVS SCHEDULE)  (FOR FUNCTIONS 3&4
(FOR FUNCTION 1]                      (2-UPDATE FROM KEYBOARD]                    MMDDYY
(DO YOU WANT BACKLOG INCLUDED]        (3-MERGE RECORDS]              (START DATE [  13     ]
(IN NEXT AVS RUN-Y OR N][ 4 ]         (4-REPORT]                     (END DATE   [  14     ]
                                                 MMDDYY              (SHIFT      [  15   ]
(FOR FUNCTION 2](ENTER DATE FOR ALL UPDATES][    5    ] (SHIFT][  6  ]
   (ORIGIN]    (DESTINATION]     (SIZE]   (VEHICLE]   (EMERGENCY?]   (RPLCE ENTRY?]
(1][   7    ]   [    8    ]     [ 9 ]    [  10  ]       [11]             [12]
(2][        ]   [         ]     [   ]    [      ]       [  ]             [  ]
(3][        ]   [         ]     [   ]    [      ]       [  ]             [  ]
(4][        ]   [         ]     [   ]    [      ]       [  ]             [  ]  (BEFORE X-MIT.]
(5][        ]   [         ]     [   ]    [      ]       [  ]             [  ]  (POSITION]
(6][        ]   [         ]     [   ]    [      ]       [  ]             [  ]  (CURSOR HERE[   ]
              (FIELD]          (DESCRIPTION]                  (ERROR]          (DESCRIPTION]
     (ERROR][         ] [                      ] (ERROR][         ] [                      ]
     (ERROR][         ] [                      ] (ERROR][         ] [                      ]
     (ERROR][         ] [                      ] (ERROR][         ] [                      ]
```

Figure 13 - AVS3 Frame Description

- the name of the truck which delivered the pallets
- the number of pallets delivered as regular orders
- the number of pallets delivered as emergency orders

Report of records that have data from only one shift will also include the number of pallets that were not scheduled as deliveries by AVS1 or AVS2. These statistics are arranged in the same way as the others and are organized by sending and receiving warehouses.

Appendix D gives the AVS3 program listing and flowcharts.

Appendix E provides illustrative examples of AVS1, AVS2, and history file entries and output. The printouts are designed to be used directly as dispatch schedules.

ACKNOWLEDGMENT

The authors wish to acknowledge the cooperation and B3500 System expertise of Robert E. Lee and Robert Owens, Code 61 - NSC, Charleston, S.C. Without their assistance AVS could not have been modified for the B3500 computer system.

APPENDIX A - USER's MANUAL

INFORMATION RETRIEVAL SYSTEM (SINR)

For ease of user data entry, AVS employs the SINR Routines provided by the Fleet Material Support Office as a uniform automatic data processing system for Naval Supply Centers. User instructions and data formatting are displayed on a CRT screen. This display is referred to by SINR as a "frame". AVS frames are given as follows:

FRAME #	DESCRIPTION
A00	General description of all frames available to AVS
A01	Order description input
A02	Vehicle description input
A03	Input options for regular and emergency orders
A04	Run execution
A05	Input options for emergency orders
A06	Clear and restart, given as an option of A04
A07	History file update options

Enter 6 digit password and transmit by pressing XMIT key. When "PASSWORD" has been cleared from the screen, enter the following commands:

ENTER

*DCH MODE FRAME (transmit)

System Reply

FRAME MODE ENABLED

ENTER

FRM #Name, #A01, #A02, #A03, #A04, #A05, or #A07, of frame desired (transmit)

---

* System commands are specified by upper case letters

SYSTEM REPLY

The frame specified will appear on the screen

ENTER

Key in data between displayed [ ]. The skip tab key may be used to position data. When the frame is complete, (transmit).

SYSTEM REPLY

The system will check the correctness of the data entered and will display error or acceptance messages. If errors appear in the data, position the cursor at the beginning of the frame and re-enter the frame. To clear the screen before the next frame request, key "HOME" and "SHIFT" at the same time. When the screen is clear, the user may request the next frame. When all necessary frames have been completed and AVS has been executed, the user may exit the system by:

ENTER

DCH BYE (transmit)

SYSTEM REPLY

PASSWORD

REGULAR ORDER SCHEDULING INSTRUCTIONS

To perform a regular order scheduling run, complete frames A01, A02, A03, and A04.

FRAME A01

Figure 14 shows a typical Frame A01 as it appears on the CRT screen. Enter the following data on A01:

FIELD	DESCRIPTION
1	"AVS" System Doc ID
2	"1" for this data frame

FIELD	DESCRIPTION
3	Order size or number of pallets to be moved from the origin site to the destination site. If the number of pallets is less than 10, enter leading zero
4	Origin site name, up to 6 characters, for a site as given in Table 1
5	Destination site, up to 6 characters, for a site as given in Table 1

Twenty orders may be entered on each A01 frame. If more than 20 orders are needed, fill and transmit A01 as many times as required. The maximum number of orders per run is 99. If the number of orders needed is less than 20, skip forward and position cursor at "LAST ORDER PROCESSED" space and transmit. Wait for the system's reply. If errors appear, re-enter frame and transmit.

FRAME A02

Figure 15 shows Frame A02 as it appears on the CRT screen. Enter the following data on A02:

FIELD	DESCRIPTION
1	"AVS" System Doc ID
2	"2" for this frame
3	"X" if this vehicle is to be used in AVS "*" if specified industrial tractor is to be an IT. Otherwise, the vehicle will be considered a tractor trailer, TT.
4	Capacity, maximum number of pallets vehicle can carry. Skip field if default value is desired. Defaults: ST = 7, TR = 12, TT = 14, IT = 10
5	Maximum route time in minutes for this vehicle. Skip if default is desired Default = 480 min

Follow instruction given on frame to transmit data.

FRAME A03

Figure 16 shows Frame A03 as it appears on the CRT screen. Enter the following data on A03:

FIELD	DESCRIPTION
1	"AVS" System Doc ID
2	"3" for the frame
3	Date of schedule
4	Start time of shift using 24 hr clock
5	Maximum length of shift Default = 480 min

Position cursor at "CURSOR" and transmit. Wait until system replies before proceeding.

FRAME A04

Figure 17 shows Frame A04 as it appears on the CRT screen. Enter the following data on A04:

1	"AVS" for system Doc ID
2	"4" to produce schedules for data "6" to clear registers and re-enter data for frames A01, A02, A03, A05

Move cursor to "CURSOR" and transmit. No reply will be made by system.

EMERGENCY ORDERS SCHEDULING INSTRUCTIONS

To perform an emergency order scheduling run, complete frames A01, A02, A03, A04, and A05. The emergency order program (AVS2) uses the same information as the regular orders. Delivery preference options are given in Frame A05, Figure 18. The items for frames A01, A02, and A03 which apply only to the emergency orders are described as follows:

FRAME A01

```
(FRM =A01                AUTOMATED VEHICLE SCHEDULING -AVS- ORDER INPUT
DOCID  [ 1  ]
FRAME  [ 2 ]
)(ENTER ORDERS -          SIZE     ORIGIN     DESTINATION          SIZE     ORIGIN     DESTINATION
 (   ORDERS          1][ 3  ] [   4    ] [   5    ](    2][    ] [         ] [         ]
 (   ORDERS          3][    ] [        ] [        ](    4][    ] [         ] [         ]
 (   ORDERS          5][    ] [        ] [        ](    6][    ] [         ] [         ]
 (   ORDERS          7][    ] [        ] [        ](    8][    ] [         ] [         ]
 (   ORDERS          9][    ] [        ] [        ](   10][    ] [         ] [         ]
 (   ORDERS         11][    ] [        ] [        ](   12][    ] [         ] [         ]
 (   ORDERS         13][    ] [        ] [        ](   14][    ] [         ] [         ]
 (   ORDERS         15][    ] [        ] [        ](   16][    ] [         ] [         ]
 (   ORDERS         17][    ] [        ] [        ](   18][    ] [         ] [         ]
 (   ORDERS         19][    ] [        ] [        ](   20][    ] [         ] [         ]
(LAST ORDER PROCESSED][    ]
                                                                              (CURSOR•]
)(   ERRORS       ORDER      EXPLANATION                    ORDER      EXPLANATION
 (   ERRORS       [    ] [                        ]       [    ] [                    ]
 (   ERRORS       [    ] [                        ]       [    ] [                    ]
 (   ERRORS       [    ] [                        ]       [    ] [                    ]
 (   ERRORS       [    ] [                        ]       [    ] [                    ]
 (   ERRORS       [    ] [                        ]       [    ] [                    ]
```

Figure 14 - Frame A01

FRAME A02

```
(FRM =A02              AUTOMATED VEHICLE SCHEDULING -AVS- VEHICLE INPUT
DOCID  [ 1  ]
FRAME  [ 2 ]  (ENTER 2]
(SELECT VEHICLES, SPECIFY CAPACITIES AND TIMES BELOW
(     TYPE                 USE    CAPAC   TIME        USE    CAPAC   TIME        USE    CAPAC   TIME
  (STRADDLES             1][ 3 ]  [ 4 ]  [  5  ]  ( 2][   ]  [    ]  [     ]  ( 3][   ]  [    ]  [     ]
                        ( 4][   ]  [    ]  [     ]  ( 5][   ]  [    ]  [     ]  ( 6][   ]  [    ]  [     ]
                        ( 7][   ]  [    ]  [     ]  ( 8][   ]  [    ]  [     ]  ( 9][   ]  [    ]  [     ]
                        (10][   ]  [    ]  [     ]  (11][   ]  [    ]  [     ]  (12][   ]  [    ]  [     ]
  (TRNSPRTRS             1][   ]  [    ]  [     ]  ( 2][   ]  [    ]  [     ]  ( 3][   ]  [    ]  [     ]
                        ( 4][   ]  [    ]  [     ]  ( 5][   ]  [    ]  [     ]  ( 6][   ]  [    ]  [     ]
  (IND TRCTRS            1][   ]  [    ]  [     ]  ( 2][   ]  [    ]  [     ]  ( 3][   ]  [    ]  [     ]
                        ( 4][   ]  [    ]  [     ]  ( 5][   ]  [    ]  [     ]  ( 6][   ]  [    ]  [     ]
                        ( 7][   ]  [    ]  [     ]  ( 8][   ]  [    ]  [     ]  ( 9][   ]  [    ]  [     ]
                        (10][   ]  [    ]  [     ]  (11][   ]  [    ]  [     ]  (12][   ]  [    ]  [     ]
(POSITION CURSOR HERE][   ](BEFORE XMITTING DATA
(WAIT FOR OUTPUT BELOW BEFORE PROCEEDING
       [    ] [                              ]       [     ] [                              ]
       [    ] [                              ]       [     ] [                              ]
       [    ] [                              ]       [     ] [                              ]
       [    ] [                              ]       [     ] [                              ]
(LAST VEHICLE PROCESSED]   [     ] [                              ]
```

Figure 15 - Frame A02

FRAME A03

```
(FRM =A03                    AUTOMATED VEHICLE SCHEDULING -AVS-
                                  (SCHEDULE INFORMATION)

DOCID  [ 1 ]
FRAME  [ 2 ] (ENTER 3)

     (ENTER DATE) [   3   ]     (SCHEDULING START TIME) [ 4  ]
                  (MMDDYY)                              (24 HR CLOCK)

          (MAXIMUM ROUTE DURATION)  [ 5  ] (MINUTES)              (CURSOR)[  ]

     (ERRORS)  [      ] [ NO ERRORS                ]
     (ERRORS)  [      ] [                          ]
     (ERRORS)  [      ] [                          ]
     (ERRORS)  [      ] [                          ]
     (ERRORS)  [      ] [                          ]
     (ERRORS)  [      ] [                          ]
```

Figure 16 - Frame A03

FRAME A04

```
(FRM #A04          AUTOMATED VEHICLE SCHEDULING -AVS-
                      (START / CLEAR AND RESTART]
DOCID  [  1  ]

                (TO GENERATE SCHEDULES ENTER 4]
                (TO CLEAR ALL DATA AND RESTART ENTER 6])          [ 2 ]
(CURSOR][   ]
```

Figure 17 - Frame A04

FRAME A01

FIELD	DESCRIPTION
1	"AVS" System Doc ID
2	"1" for this frame
3	Order size, number of pallets
4	Origin site name
5	Destination site name

A maximum of 99 emergency orders may be entered per emergency order run.

FRAME A02

FIELD	DESCRIPTION
1	"AVS" System Doc ID
2	"2" for this frame
3	"S" to use the same vehicles as the previous regular order run. Otherwise, enter "X" or "*" for each vehicle to be used and complete Field 5 for each vehicle to be modified.
5	Time in minutes of maximum route Default = 480 min

FRAME A03

FIELD	DESCRIPTION
1	"AVS" System Doc ID
2	"3" for this frame
3	Date
4	Time of emergency orders using 24-hr clock
5	Maximum length of shift (same as regular orders) Default = 480 min

FRAME A04

Frame A04 is used as before to execute the emergency orders program.

FRAME A05

Figure 18 shows Frame A05 as it appears on CRT screen. Data to be entered on A05 are as follows:

FIELD	DESCRIPTION
1	"AVS" System Doc ID
2	"5" for this frame
3/4	Answer questions on frame

Position cursor at "CURSOR" and transmit. Do not clear screen until MIX and PROPT values are returned.

FRAME A05

EMERGENCY VEHICLE SCHEDULING -EVS- OPTION INPUT

```
DOCID([  1  ]) ENTER AVS
FRAME[ 2 ]     ENTER 5 FOR THIS FRAME
    MAY THE USE OF MORE THAN ONE VEHICLE TYPE
        BE ALLOWED TO FILL THIS ORDER [ 3 ] ENTER Y FOR YES - N FOR NO

    MAY NON-EMERGENCY ORDERS BE BUMPED TO FILL
        THIS ORDER [ 4 ] ENTER Y FOR YES - N FOR NO
       CURSOR [  ]
RESULTS
  MIX     [  ]
  PROPT     [  ]
```

Figure 18 - Frame A05

History File Instructions

To perform updates and report generation of the AVS history file, frame A07 must be completed (See Figure 19). The following four functions may be performed using this frame:

FUNCTION	ACTION
1	Update the history file using the schedule produced by AVS1 or AVS2
2	Update or add specific entries to the history file
3	Merge two or more records to create an aggregate of the records in the history file, replacing the old records with the new one.
4	Produce a report of either an individual record or an aggregate of several records

Frame A07 as it is filled out for each of the functions is described as follows:

FIELD	DESCRIPTION
1	"AVS" System Doc ID
2	"7" for this frame
3	Desired function "1", "2", "3", or "4"

Function 1 Instructions

FIELD	DESCRIPTION
4	"Y" or "N". If "Y", a file containing any orders that were not scheduled by AVS1 or AVS2 will be included in the next AVS run (UNIMPLEMENTED)

Function 2 Instructions

FIELD	DESCRIPTION
5	Date (MMDDYY) of the AVS History File record to be updated
6	Time (24-hour clock) of AVS history file record to be updated
7	Warehouse from which shipment was sent
8	Warehouse which received shipment
9	Number of pallets
10	Name of vehicle on which the shipment was made
11	"Y" emergency order, "N" otherwise
12	"Y" replace any data in the History File, "N" corresponding entry in the history file is to be incremented by the number in Field 9

Function 3 and 4 Instructions

FIELD	DESCRIPTION
13	Start Date (MMDDYY) for the range of history file records to be included in the report or in the merge record
14	End Date (MMDDYY) to indicate the date of the last record to be included in the report or in the merge record. A value equal to the start date (Field 13) indicates all records for that date are to be included.
15	Shift of record to be in the report. This field is used only for function 4 (report generator) and only when fields 13 and 14 are the same. It is ignored in all other instances.

FRAME A07

```
(FRM =A07                AUTOMATED VEHICLE SCHEDULING - HISTORY FILE INPUT
DOCID  [  1  ]
FRAME  [ 2 ]  (ENTER ?)  (FUNCTION[ 3 ](1-UPDATE FROM AVS SCHEDULE)  (FOR FUNCTIONS 3&4
(FOR FUNCTION 1)                       (2-UPDATE FROM KEYBOARD)                    MMDDYY
(DO YOU WANT BACKLOG INCLUDED)         (3-MERGE RECORDS)              (START DATE[  13      ]
(IN NEXT AVS RUN-Y OR N)[ 4 ]          (4-REPORT)                     (END DATE   [  14      ]
                                                 MMDDYY             (SHIFT      [  15   ]
(FOR FUNCTION 2)(ENTER DATE FOR ALL UPDATES)[    5    ] (SHIFT)[  6   ]
    (ORIGIN)    (DESTINATION)     (SIZE)    (VEHICLE)   (EMERGENCY?)   (RPLCE ENTRY?)
(1)[    7    ]   [    8    ]      [ 9 ]     [  10  ]        [11]            [12]
(2){         }   {         }      {   }     {      }        {  }            {  }
(3)[         ]   [         ]      [   ]     [      ]        [  ]            [  ]
(4)[         ]   [         ]      [   ]     [      ]        [  ]            [  ]  (BEFORE X-MIT.)
(5)[         ]   [         ]      [   ]     [      ]        [  ]            [  ]  (POSITION)
(6)[         ]   [         ]      [   ]     [      ]        [  ]            [  ]  (CURSOR HERE[   ]
              (FIELD)          (DESCRIPTION)                      (ERROR)          (DESCRIPTION)
     (ERROR)[         ]  [                        ] (ERROR)[         ]  [                        ]
     (ERROR)[         ]  [                        ] (ERROR)[         ]  [                        ]
     (ERROR)[         ]  [                        ] (ERROR)[         ]  [                        ]
```

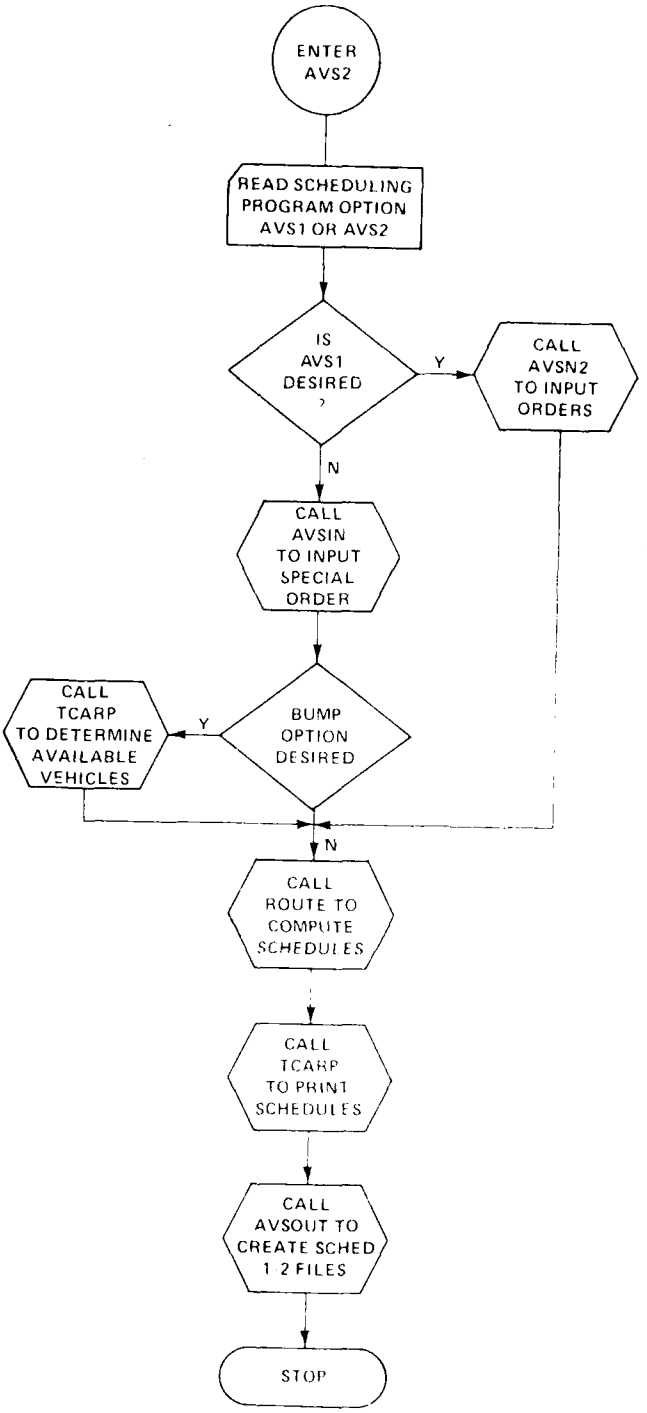
Figure 19 - Frame A07

APPENDIX B - PROGRAMMER'S GUIDE - SUBROUTINE FLOWCHARTS/LISTINGS

ROUTINE: AVS2

Description:

AVS2 is an executive routine which executes each segment of the scheduling algorithm.

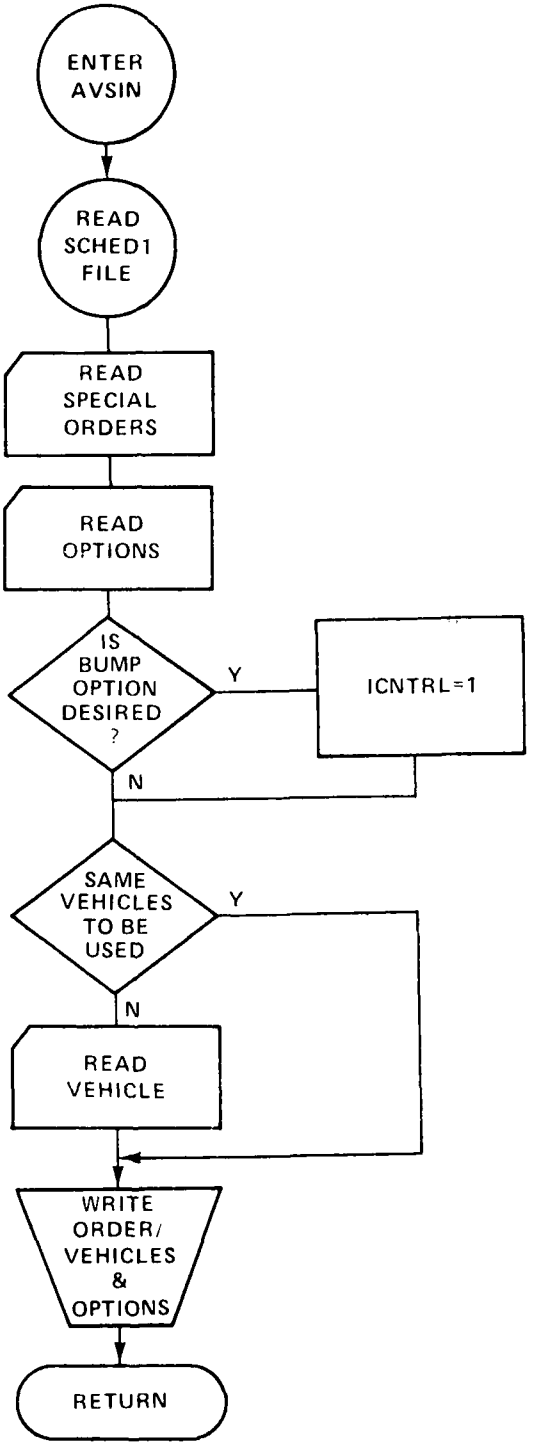

ENTER AVS2
READ SCHEDULING PROGRAM OPTION AVS1 OR AVS2
IS AVS1 DESIRED ?
Y
CALL AVSN2 TO INPUT ORDERS
N
CALL AVSIN TO INPUT SPECIAL ORDER
BUMP OPTION DESIRED
Y
CALL TCARP TO DETERMINE AVAILABLE VEHICLES
N
CALL ROUTE TO COMPUTE SCHEDULES
CALL TCARP TO PRINT SCHEDULES
CALL AVSOUT TO CREATE SCHED 1 2 FILES
STOP

```
      IDENT AVS2                                                        AVS2   2
      SIZE INTEGER=7                                                    AVS2   3
      SEGMENT AVSIN,AVSN2,AVSOUT,ROUTE,BLDTR,BUILDS,SRTDST,TCARP,TCONV,NOW  AVS2   4
      FILE 1=SCHED1,UNIT=DISK,BLOCKING=1,RECORD=80,LOCK                 AVS2   5
      FILE 2=SCHED2,UNIT=DISK,BLOCKING=1,RECORD=80,LOCK                 AVS2   6
      FILE 5=VS2IN,UNIT=DISK,BLOCKING=1,RECORD=80,LOCK                  AVS2   7
      C*****************************************************************AVS2   8
      C                                                                 AVS2   9
      C                        (XFORTN COMPILER)                        AVS2  10
      C                                                                 AVS2  11
      C                                                                 AVS2  12
      C                                                                 AVS2  13
      C                                                                 AVS2  14
      C                                                                 AVS2  15
      C     AVS2 IS A PROGRAM FOR ROUTING UP TO 50 VEHICLES OF          AVS2  16
      C     THREE DIFFERENT CLASSES TO AS MANY AS 100 WAREHOUSES        AVS2  17
      C     IN A NAVY WAREHOUSE COMPLEX.  THIS PARTICULAR DECK IS       AVS2  18
      C     FOR THE NAVAL SUPPLY CENTER IN CHARLESTON, S.C.             AVS2  19
      C     EXECUTIVE ROUTINE CALLS EACH MODULE INTO CORE               AVS2  20
      C      AVSIN - READS ALL INPUT  AND CREATES INITIAL ORDER LISTS   AVS2  21
      C     ROUTE - CREATES SCHEDULE FROM ORDERS AND AVAILABLE VEHICLES  AVS2  22
      C     TCARP - PRINTS SCHEDULES                                    AVS2  23
      C     AVSOUT - CREATES UPDATE TAPE 2                              AVS2  24
      C*****************************************************************AVS2  25
      C                                                                 AVS2  26
            INTEGER PTSOR,CAPAC,TRUCK,DATE,PTTRK,ONUMB                  AVS2  27
           * ,TRKSAV                                                    AVS2  28
            ALPHA WHNAM                                                 AVS2  29
            REAL LTIME                                                  AVS2  30
            COMMON                                                      AVS2  31
           */GEN/ RTTIM,MINLD(4)                                        AVS2  32
           */WHINTG/ NWARE,NAREA(10)                                    AVS2  33
           */SPORD/ ICNTRL,SAVTIM,ISORD                                 AVS2  34
           */SAVEP/ NSAV(4),TRKSAV(4)                                   AVS2  35
           */SCHEDL/ ONUME(200),INFO(200),IDESTP(200),IAREA(200),LFRWD(200),  AVS2  36
           *LBKWD(200),LOFWD(200),LOBWD(200),ATIME(200),STOPT(200)      AVS2  37
           */TRUCKS/ PTSOR(50),TRUCK(50),CAPAC(50),STIME(50),LTIME(50),  AVS2  38
           * RTLIM(50),TLEFT(50),NT                                     AVS2  39
           */WHOUSE/ WHNAM(52)                                          AVS2  40
           */TIMTAB/ TTIME(3,45),TTIM2(6)                               AVS2  41
           */MSGLNS/ NORDR,NTRKS(4),PTTRK(4)                            AVS2  42
           */INOPT/ SHIFT,DATE                                          AVS2  43
           */BLDS/ LASTW,LASTA,NEXTA,ITRUCK,ITYPE,IPASS,NPALTS,TIME     AVS2  44
           */LOADSV/ LOAD                                               AVS2  45
            ISORD=-100                                                  AVS2  46
            DO 1000 I=1,4                                               AVS2  47
            TRKSAV(I)=-1                                                AVS2  48
      1000  NSAV(I)=0                                                   AVS2  49
            ICNTRL=1                                                    AVS2  50
            READ(5,500) IAVS                                            AVS2  51
            IF(IAVS.EQ.1) CALL AVSIN                                    AVS2  52
            IF(IAVS.EQ.2) CALL AVSIN                                    AVS2  53
            IF(ICNTRL.EQ.0) CALL TCARP                                  AVS2  54
            CALL ROUTE(IAVS)                                            AVS2  55
            ICNTRL=1                                                    AVS2  56
            CALL TCARP                                                  AVS2  57
            CALL AVSOUT(IAVS)                                           AVS2  58
        500 FORMAT(4X,I1)                                               AVS2  59
            STOP                                                        AVS2  60
            END                                                         AVS2  61
```

ROUTINE: AVSIN

Description:

AVSIN inputs the special orders to be considered, the vehicles to handle them, and the schedule run options.


ENTER AVSIN
READ SCHED1 FILE
READ SPECIAL ORDERS
READ OPTIONS
IS BUMP OPTION DESIRED ?
Y
ICNTRL=1
N
SAME VEHICLES TO BE USED
Y
N
READ VEHICLE
WRITE ORDER/ VEHICLES & OPTIONS
RETURN

```
      SUBROUTINE AVSIN                                                  AVSIN  2
C*****************************************************************    AVSIN  3
C                                                                       AVSIN  4
C     AVSIN INPUTS ALL PARAMETERS NECESSARY FOR THE SCHEDULE            AVSIN  5
C     COMPUTATIONS. IT ALSO SORTS ORDERS AND VEHICLES TO                AVSIN  6
C     TO REDUCE EXECUTION TIME.                                         AVSIN  7
C                                                                       AVSIN  8
C*****************************************************************    AVSIN  9
C                                                                       AVSIN 10
      INTEGER OSTART(16),OEND(16)                                       AVSIN 11
      INTEGER PTSOR,CAPAC,TRUCK,ONUMB                                   AVSIN 12
      INTEGER PTTRK,DATE                                                AVSIN 13
      ALPHA BUMP(2),WHNAM,TYPE(4),AST,IORIG,ITERM,ILPHA                 AVSIN 14
      INTEGER PROPT,SORDR,TRKSAV                                        AVSIN 15
      REAL LTIME                                                        AVSIN 16
      COMMON                                                            AVSIN 17
     */GEN/ RTTIM,MINLD(4)                                              AVSIN 18
     */SAVEP/ NSAV(4),TRKSAV(4)                                         AVSIN 19
     */WHINTG/ NWARE,NAREA(16)                                          AVSIN 20
     */SCHEDL/ ONUMB(200),INFO(200),IDESTP(200),IAREA(200),LFRWD(200),  AVSIN 21
     *LBKWD(200),LCFWD(200),LCBWD(200),ATIME(200),STOPT(200)            AVSIN 22
     */SPORD/ ICNTRL,SAVTIM,SORDR                                       AVSIN 23
     */TRUCKS/ PTSOR(50),TRUCK(50),CAPAC(50),STIME(50),LTIME(50),       AVSIN 24
     * RTLIM(50),TLEFT(50),NT                                          AVSIN 25
     */WHOUSE/ WHNAM(92)                                                AVSIN 26
     */TIMTAB/ TTIME(3,45),TTIM2(6)                                     AVSIN 27
     */MSCLNS/ NORDR,NTRKS(4),PTTRK(4)                                  AVSIN 28
     */INOPT/ SHIFT,DATE                                                AVSIN 29
      DATA TYPE/2HST,2HTR,2HTT,2HIT/                                    AVSIN 30
      DATA BUMP/2HNO,3HYES/                                             AVSIN 31
      REWIND 1                                                          AVSIN 32
      NSTART=0                                                          AVSIN 33
      READ(1,102) NWARE,(NAREA(I),I=1,16),(WHNAM(I),I=1,NWARE)          AVSIN 34
      READ (1,100) (ONUMB(I),INFO(I),IDESTP(I),IAREA(I),               AVSIN 35
     * LFRWD(I),LBKWD(I),LCFWD(I),LCBWD(I),ATIME(I),STOPT(I),          AVSIN 36
     * I=1,200)                                                        AVSIN 37
      READ (1,101) (PTSOR(I),TRUCK(I),CAPAC(I),STIME(I),LTIME(I),      AVSIN 38
     * RTLIM(I),TLEFT(I),I=1,50)                                       AVSIN 39
      READ (1,104) ((TTIME(I,J),I=1,3),J=1,45),TTIM2                    AVSIN 40
      READ(1,105) PTTRK,NTRKS,NORDR,SORDR                               AVSIN 41
      READ (1,106) SHIFT,DATE                                           AVSIN 42
      READ (1,107) MARK                                                 AVSIN 43
      REWIND 1                                                          AVSIN 44
      DO 9000 I=1,NORDR                                                 AVSIN 45
      INFO(I)=IABS(INFO(I))                                             AVSIN 46
      IF(IDESTP(I).EQ.0) GO TO 9000                                     AVSIN 47
      INFO(I)=-INFO(I)                                                  AVSIN 48
 9000   CONTINUE                                                        AVSIN 49
      WRITE(6,600)                                                      AVSIN 50
      IMO = DATE / 10000                                                AVSIN 51
      IDAY = (DATE   10000*IMO) / 100                                   AVSIN 52
      IYR = DATE - 10000*IMO - 100*IDAY                                 AVSIN 53
      WRITE(6,601) IMO,IDAY,IYR,SHIFT                                   AVSIN 54
      WRITE(6,602)                                                      AVSIN 55
 2000 READ(5,500) STIM,ISIZE,IORIG,ITERM                                AVSIN 56
      IF(STIM.LE.0.0) GO TO 2500                                        AVSIN 57
      SAVTIM =STIM                                                      AVSIN 58
```

```
      SUBROUTINE AVSIN       74/74   OPT=0 ROUND=*/ TRACE              FTN 4.6+460          10/17/80  10.04.12

                      NORDR=NORDR+1                                                                    AVSIN 59
                      IF(MSTART.EQ.0) MSTART=NORDR                                                     AVSIN 60
   60                 SORDR=SORDR-1                                                                    AVSIN 61
                      I=MOD(IABS(SORDR),100)                                                           AVSIN 62
                      WRITE(6,603) I,ISIZE,IORIG,ITERM                                                 AVSIN 63
                      IF((I-(I/5)*5).EQ.0) WRITE(6,606)                                                AVSIN 64
                      INFO(NORDR)=ISIZE+MATCH(IORIG,IA1)*10000+MATCH(ITERM,IA2)*100                    AVSIN 65
   65                 IAREA(NORDR)=IA1*100+IA2                                                         AVSIN 66
                      ONUMB(NORDR)=SORDR                                                               AVSIN 67
                      GO TO 2000                                                                       AVSIN 68
                C     SORT ORDERS BY AREA                                                              AVSIN 69
                 2500 LIMIT=NORDR-1                                                                    AVSIN 70
   70                 DO 2600 I=MSTART,LIMIT                                                           AVSIN 71
                      ISTART=I+1                                                                       AVSIN 72
                      IF(ISTART.GT.NORDR) GO TO 2600                                                   AVSIN 73
                      DO 2700 J=ISTART,NORDR                                                           AVSIN 74
                      IF(IAREA(I).LE.IAREA(J)) GO TO 2700                                              AVSIN 75
   75                 ISAVEA=IAREA(J)                                                                  AVSIN 76
                      ISAVEI=INFO(J)                                                                   AVSIN 77
                      ISAVEO=ONUMB(J)                                                                  AVSIN 78
                      ONUMB(J)=ONUMB(I)                                                                AVSIN 79
                      IAREA(J)=IAREA(I)                                                                AVSIN 80
   80                 INFO(J)=INFO(I)                                                                  AVSIN 81
                      ONUMB(I)=ISAVEO                                                                  AVSIN 82
                      IAREA(I)=ISAVEA                                                                  AVSIN 83
                      INFO(I)=ISAVEI                                                                   AVSIN 84
                 2700 CONTINUE                                                                         AVSIN 85
   85            2600 CONTINUE                                                                         AVSIN 86
                C                                                                                      AVSIN 87
                C                                                                                      AVSIN 88
                C     MARK START OF COMMONS, ORIGIN, DESTINATIONS                                      AVSIN 89
                C                                                                                      AVSIN 90
   90                 DO 2400 I=1,16                                                                   AVSIN 91
                      OEND(I)=0                                                                        AVSIN 92
                 2400 OSTART(I)=0                                                                      AVSIN 93
                      DO 2300 I=MSTART,NORDR                                                           AVSIN 94
                      JAREA=IAREA(I)/100                                                               AVSIN 95
   95                 IF(OSTART(JAREA).LE.0) OSTART(JAREA)=I                                           AVSIN 96
                      IF(I.EQ.NORDR) OEND(JAREA)=I                                                     AVSIN 97
                      IF(I+1.GT.NORDR) GO TO 2300                                                      AVSIN 98
                      IF(JAREA.NE.IAREA(I+1)/100) OEND(JAREA)=I                                        AVSIN 99
                 2300 CONTINUE                                                                         AVSIN100
  100           C     SORT BY ORIGIN AND DESTINATION IN SAME AREA                                      AVSIN101
                      DO 2200 I=1,16                                                                   AVSIN102
                      IF(OSTART(I).LE.0) GO TO 2200                                                    AVSIN103
                      ISTART=OSTART(I)                                                                 AVSIN104
                      IEND=OEND(I)                                                                     AVSIN105
  105                 IF(ISTART.EQ.IEND) GO TO 2200                                                    AVSIN106
                      JEND=IEND-1                                                                      AVSIN107
                      DO 2250 J=ISTART,JEND                                                            AVSIN108
                      JSTART=J+1                                                                       AVSIN109
                      DO 2275 K=JSTART,IEND                                                            AVSIN110
  110                 IF(INFO(J).LE.INFO(K)) GO TO 2275                                                AVSIN111
                      ISAVEA=IAREA(J)                                                                  AVSIN112
                      ISAVEI=INFO(J)                                                                   AVSIN113
                      ISAVEO=ONUMB(J)                                                                  AVSIN114
                      IAREA(J)=IAREA(K)                                                                AVSIN115
```

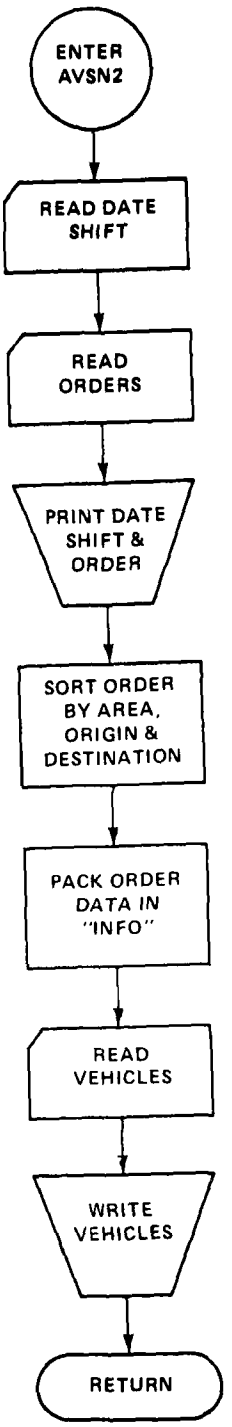
```
                INFO(J)=INFO(K)                                          AVSIN116
                ONUMB(J)=ONUMB(K)                                        AVSIN117
                IAREA(K)=ISAVEA                                          AVSIN118
                INFO(K)=ISAVEI                                           AVSIN119
                ONUMB(K)=ISAVEC                                          AVSIN120
 2275       CONTINUE                                                     AVSIN121
 2250       CONTINUE                                                     AVSIN122
 2200       CONTINUE                                                     AVSIN123
            WRITE(6,608) SAVTIM                                          AVSIN124
            READ (5,501) MIX,PROPT                                       AVSIN125
            WRITE(6,607) BUMP(PROPT+1)                                   AVSIN126
            ICNTRL=0                                                     AVSIN127
            IF(PROPT.LE.0) ICNTRL=2                                      AVSIN128
            NTSAV=1                                                      AVSIN129
            NT=NTRKS(1)+NTRKS(2)+NTRKS(3)                                AVSIN130
C                                                                        AVSIN131
C     TRUCK INPUT                                                        AVSIN132
C                                                                        AVSIN133
            READ(5,502) ILPHA                                            AVSIN134
            IF(ILPHA.EQ.1HA) GO TO 4000                                  AVSIN135
            DO 2225 J=1,4                                                AVSIN136
            NSAV(J)=NTRKS(J)                                             AVSIN137
            TRKSAV(J)=PTTRK(J)                                           AVSIN138
            PTTRK(J)=PTTRK(J)+NTRKS(J)                                   AVSIN139
 2225       NTRKS(J)=0                                                   AVSIN140
            ISS=SHIFT                                                    AVSIN141
            XSHFT=(ISS/100)*60+MOD(ISS,100)                              AVSIN142
            ISS=SAVTIM                                                   AVSIN143
            SORTIM=(ISS/100)*60+MOD(ISS,100)                             AVSIN144
            SORTIM=SORTIM-XSHFT                                          AVSIN145
            SORTIM=RTTIM-SORTIM                                          AVSIN146
            RTMAX=RTTIM                                                  AVSIN147
            IF(SORTIM.LE.RTMAX) RTMAX=SORTIM                             AVSIN148
            IF(IRTMX.NE.0) RTMAX = FLOAT(IRTMX)                          AVSIN149
            I=NT                                                         AVSIN150
            NTSAV=NT+1                                                   AVSIN151
            ITCNT=0                                                      AVSIN152
 3000       READ(5,505) AST,INTRK,INTIM,INCAP                            AVSIN153
            IF(INTRK.LE.0.OR.INTRK.GT.50) GO TO 3100                     AVSIN154
            IF(AST.NE.1H*) GO TO 3005                                    AVSIN155
            ITCNT=ITCNT+1                                                AVSIN156
            INTRK=PTTRK(4)+ITCNT                                         AVSIN157
            ITYPE=4                                                      AVSIN158
 3005       IF(INTRK.LE.40) ITYPE=3                                      AVSIN159
            IF(INTRK.LE.30) ITYPE =2                                     AVSIN160
            IF(INTRK.LE.20) ITYPE=1                                      AVSIN161
            ICNTRL=1                                                     AVSIN162
            NTRKS(ITYPE)=NTRKS(ITYPE)+1                                  AVSIN163
            INTRK=PTTRK(ITYPE)+NTRKS(ITYPE)                              AVSIN164
            I=I+1                                                        AVSIN165
            TRUCK(I) = INTRK                                             AVSIN166
            IF(INTIM.NE.0) RTLIM(INTRK) = FLOAT(INTIM)                   AVSIN167
            IF(INTIM.EQ.0) RTLIM(INTRK) = RTMAX                          AVSIN168
            TLEFT(INTRK)=RTLIM(INTRK)                                    AVSIN169
                 IF  (INCAP.NE.0)  CAPAC(INTRK) = INCAP                  AVSIN170
            GO TO 3000                                                   AVSIN171
 3100       NT=I                                                         AVSIN172
```

```
      C                                                                 AVSIN173
       4000 WRITE(6,604)                                                AVSIN174
            IX=0                                                        AVSIN175
175         DO 4400 ITYPE=1,4                                           AVSIN176
            IF(NTRKS(ITYPE).LE.0) GO TO 4400                            AVSIN177
            NO=NTRKS(ITYPE)                                             AVSIN178
            DO 4450 II=1,NC                                             AVSIN179
            I=PTTRK(ITYPE)+II                                           AVSIN180
180         IX=IX+1                                                     AVSIN181
            IF(TRKSAV(ITYPE).LT.0) TRKSAV(ITYPE)=PTTRK(ITYPE)           AVSIN182
            IVEH=I-TRKSAV(ITYPE)                                        AVSIN183
            WRITE(6,605) IX,TYPE(ITYPE),IVEH,CAPAC(I),RTLIM(I)          AVSIN184
            IF((IX-(IX/5)*5).EQ.0) WRITE(6,606)                         AVSIN185
185         4450 CONTINUE                                               AVSIN186
            4400 CONTINUE                                               AVSIN187
            RETURN                                                      AVSIN188
             100 FORMAT(4I8,2F6.1)                                      AVSIN189
             101 FORMAT(3I8,4F6.1)                                      AVSIN190
190          102 FORMAT(10I8/7I8/(1X,10A8))                             AVSIN191
             104 FORMAT(3F6.1)                                          AVSIN192
             105 FORMAT(4I8/4I8/2I8)                                    AVSIN193
             106 FORMAT(F6.1,I8)                                        AVSIN194
             107 FORMAT(I6)                                             AVSIN195
195          500 FORMAT(F5.1,1X,I2,1X,A6,1X,A6)                         AVSIN196
             501 FORMAT(I1,1X,I1)                                       AVSIN197
             502 FORMAT(7X,A1,5X,I3)                                    AVSIN198
             503 FORMAT(I2,1X,A6,1X,A6)                                 AVSIN199
             504 FORMAT(A6,1X,I2,1X,I2,1X,I2,1X,I3)                     AVSIN200
200          505 FORMAT(A1,I2,1X,I3,1X,I2)                              AVSIN201
             600 FORMAT(1H1///13X,26(1H-)/13X,26H AVS SPECIAL ORDER PROGRAM/  AVSIN202
                *       13X,26(1H-))                                    AVSIN203
             601 FORMAT(////20X,I2,1H/,I2,1H/,I2//21X,F6.1)             AVSIN204
             602 FORMAT(/20X,6(1H-)/20X,6HORDERS/20X,6(1H-)/)           AVSIN205
205          603 FORMAT( 8X,I2,3X,I2,14H PALLETS FROM ,A6,4H TO ,A6)    AVSIN206
             604 FORMAT(/20X,17(1H-)/20X,17HVEHICLES SELECTED           AVSIN207
                *      /20X,17(1H-)/)                                  AVSIN208
             605 FORMAT(4X,I2,1X,8HVEHICLE  ,A2,I2,12H CAPACITY = ,I3,  AVSIN209
                *    8H PALLETS, 19H, ROUTE DURATION = ,F6.1,6H MINS. )  AVSIN210
210          606 FORMAT(1HO)                                            AVSIN211
             607 FORMAT(//5X,14HBUMP OPTION = ,A6//)                    AVSIN212
             608 FORMAT(//5X,21HSPECIAL ORDER TIME = ,F6.0)             AVSIN213
                 END                                                    AVSIN214
```

ROUTINE: AVSN2

Description:

AVSN2 inputs the regular orders to be considered, the vehicles to handle them, and the date and shift of the schedules to be produced. AVSN2 also sorts orders by areas and origin and destination warehouses to reduce execution time. Order information is packed to reduced storage.


ENTER AVSN2
READ DATE SHIFT
READ ORDERS
PRINT DATE SHIFT & ORDER
SORT ORDER BY AREA, ORIGIN & DESTINATION
PACK ORDER DATA IN "INFO"
READ VEHICLES
WRITE VEHICLES
RETURN

```
      SUBROUTINE AVSN2                                                  AVSN2  2
C*****************************************************************    AVSN2  3
C                                                                       AVSN2  4
C     AVSIN INPUTS ALL PARAMETERS NECESSARY FOR THE SCHEDULE            AVSN2  5
C     COMPUTATIONS. IT ALSO SORTS ORDERS AND VEHICLES TO                AVSN2  6
C     TO REDUCE EXECUTION TIME.                                         AVSN2  7
C                                                                       AVSN2  8
C*****************************************************************    AVSN2  9
C                                                                       AVSN2 10
      INTEGER OSTART(16),OEND(16)                                       AVSN2 11
      INTEGER CAPAC,TRUCK,ONUMB,PTTRK,PTSOR                             AVSN2 12
     * ,DATE                                                           AVSN2 13
      ALPHA WHNAM,AST,ILPHA,IORIG,ITERM                                 AVSN2 14
      REAL LTIME                                                        AVSN2 15
      COMMON                                                            AVSN2 16
     */GEN/ RTTIM,MINLD(4)                                              AVSN2 17
     */WHINTG/ NWARE,NAREA(16)                                          AVSN2 18
     */SCHEDL/ ONUMB(200),INFO(200),IDESTP(200),IAREA(200),LFRWD(200),  AVSN2 19
     *LBKWD(200),LCFWD(200),LCBWD(200),ATIME(200),STOPT(200)            AVSN2 20
     */TRUCKS/ PTSOR(50),TRUCK(50),CAPAC(50),STIME(50),LTIME(50),       AVSN2 21
     * RTLIM(50),TLEFT(50),NT                                          AVSN2 22
     */WHOUSE/ WHNAM(92)                                               AVSN2 23
     */TIMTAB/ TTIME(3,45),TTIM2(6)                                    AVSN2 24
     */MSGLNS/ NORDR,NTRKS(4),PTTRK(4)                                 AVSN2 25
     */INOPT/ SHIFT,DATE                                               AVSN2 26
     */SPORD/ ICNTRL,SAVTIM,ISORD                                      AVSN2 27
      DATA TYPE/2HST,2HTR,2HIT,2HIT/                                    AVSN2 28
      WRITE(6,600)                                                      AVSN2 29
      READ(5,500) DATE                                                  AVSN2 30
      IMO = DATE / 10000                                                AVSN2 31
      IDAY = (DATE - 10000*IMO) / 100                                   AVSN2 32
      IYR = DATE - 10000*IMO - 100*IDAY                                 AVSN2 33
      READ(5,501) SHIFT                                                 AVSN2 34
      SAVTIM=SHIFT                                                      AVSN2 35
      READ(5,502) IOPT                                                  AVSN2 36
      WRITE(6,601) IMO,IDAY,IYR,SHIFT,IOPT                              AVSN2 37
      WRITE(6,602)                                                      AVSN2 38
      NORDR=0                                                           AVSN2 39
 2000 READ(5,503) ISIZE,IORIG,ITERM                                     AVSN2 40
      IF(ISIZE.LT.0) GO TO 2500                                         AVSN2 41
      NORDR=NORDR+1                                                     AVSN2 42
      I=NORDR                                                           AVSN2 43
      WRITE(6,603) I,ISIZE,IORIG,ITERM                                  AVSN2 44
      IF((I-(I/5)*5).EQ.0) WRITE(6,606)                                 AVSN2 45
      INFO(NORDR)=ISIZE*MATCH(IORIG,IA1)*10000*MATCH(ITERM,IA2)*100     AVSN2 46
      IAREA(NORDR)=IA1*100+IA2                                          AVSN2 47
      ONUMB(NORDR)=NORDR                                                AVSN2 48
      GO TO 2000                                                        AVSN2 49
C     SORT ORDERS BY AREA                                               AVSN2 50
 2500 LIMIT=NORDR-1                                                     AVSN2 51
      DO 2600 I=1,LIMIT                                                 AVSN2 52
      ISTART=I+1                                                        AVSN2 53
      IF(ISTART.GT.NORDR) GO TO 2600                                    AVSN2 54
      DO 2700 J=ISTART,NORDR                                            AVSN2 55
      IF(IAREA(I).LE.IAREA(J)) GO TO 2700                               AVSN2 56
      ISAVEA=IAREA(J)                                                   AVSN2 57
      ISAVEI=INFO(J)                                                    AVSN2 58
```

```
                ISAVEO=ONUMB(J)                                          AVSN2 59
                ONUMB(J)=ONUMB(I)                                        AVSN2 60
   60           IAREA(J)=IAREA(I)                                        AVSN2 61
                INFO(J)=INFO(I)                                          AVSN2 62
                ONUMB(I)=ISAVEO                                          AVSN2 63
                IAREA(I)=ISAVEA                                          AVSN2 64
                INFO(I)=ISAVEI                                           AVSN2 65
   65        2700 CONTINUE                                               AVSN2 66
             2600 CONTINUE                                               AVSN2 67
             C                                                           AVSN2 68
             C                                                           AVSN2 69
             C     MARK START OF COMMONS, ORIGIN, DESTINATIONS           AVSN2 70
   70        C                                                           AVSN2 71
                DO 2400 I=1,16                                           AVSN2 72
                OEND(I)=0                                                AVSN2 73
             2400 OSTART(I)=0                                            AVSN2 74
                DO 2300 I=1,NORDR                                        AVSN2 75
   75           JAREA=IAREA(I)/100                                       AVSN2 76
                IF(OSTART(JAREA).LE.0) OSTART(JAREA)=I                   AVSN2 77
                IF(I.EQ.NORDR) OEND(JAREA)=I                             AVSN2 78
                IF(I+1.GT.NORDR) GO TO 2300                              AVSN2 79
                IF(JAREA.NE.IAREA(I+1)/100) OEND(JAREA)=I                AVSN2 80
   80        2300 CONTINUE                                               AVSN2 81
             C     SORT BY ORIGIN AND DESTINATION IN SAME AREA            AVSN2 82
                DO 2200 I=1,16                                           AVSN2 83
                IF(OSTART(I).LE.0) GO TO 2200                            AVSN2 84
                ISTART=OSTART(I)                                         AVSN2 85
   85           IEND=OEND(I)                                             AVSN2 86
                IF(ISTART.EQ.IEND) GO TO 2200                            AVSN2 87
                JEND=IEND-1                                              AVSN2 88
                DO 2250 J=ISTART,JEND                                    AVSN2 89
                JSTART=J+1                                               AVSN2 90
   90           DO 2275 K=JSTART,IEND                                    AVSN2 91
                IF(INFO(J).LE.INFO(K)) GO TO 2275                        AVSN2 92
                ISAVEA=IAREA(J)                                          AVSN2 93
                ISAVEI=INFO(J)                                           AVSN2 94
                ISAVEO=ONUMB(J)                                          AVSN2 95
   95           IAREA(J)=IAREA(K)                                        AVSN2 96
                INFO(J)=INFO(K)                                          AVSN2 97
                ONUMB(J)=ONUMB(K)                                        AVSN2 98
                IAREA(K)=ISAVEA                                          AVSN2 99
                INFO(K)=ISAVEI                                           AVSN2100
  100           ONUMB(K)=ISAVEO                                          AVSN2101
             2275 CONTINUE                                               AVSN2102
             2250 CONTINUE                                               AVSN2103
             2200 CONTINUE                                               AVSN2104
             C     TRUCK INPUT                                           AVSN2105
  105        C                                                           AVSN2106
                READ(5,504) ILPHA,(NTRKS(I),I=1,3),IRTMX                 AVSN2107
                RTMAX=RTTIM                                              AVSN2108
                IF(IRTMX.NE.0) RTMAX = FLOAT(IRTMX)                      AVSN2109
                I=0                                                      AVSN2110
  110           ITCNT=0                                                  AVSN2111
             3000 READ(5,505) AST,INTRK,INTIM,INCAP                      AVSN2112
                IF(AST.NE.1H*) GO TO 3005                                AVSN2113
                ITCNT=ITCNT+1                                            AVSN2114
                INTRK=PTTRK(6)+ITCNT                                     AVSN2115
```

```
      3005 IF(INTRK.LE.0.OR.INTRK.GT.50) GO TO 3100                    AVSN2116
           I=I+1                                                       AVSN2117
           TRUCK(I) = INTRK                                            AVSN2118
           IF(INTIM.NE.0) RTLIM(INTRK) = FLOAT(INTIM)                  AVSN2119
           IF(INTIM.EQ.0) RTLIM(INTRK) = RTMAX                         AVSN2120
           TLEFT(INTRK)=RTLIM(INTRK)                                   AVSN2121
                IF  (INCAP.NE.0)  CAPAC(INTRK) = INCAP                 AVSN2122
           GO TO 3000                                                  AVSN2123
      3100 NT=I                                                        AVSN2124
      C                                                                AVSN2125
      C     SORT TRUCK AND CALCULATE NTRKS                             AVSN2126
      C                                                                AVSN2127
           DO 3200 I = 1,NT                                            AVSN2128
           DO 3200 J = I,NT                                            AVSN2129
           IF(TRUCK(J).GE.TRUCK(I)) GO TO 3200                         AVSN2130
           ITEMP= TRUCK(J)                                             AVSN2131
           TRUCK(J) = TRUCK(I)                                         AVSN2132
           TRUCK(I) = ITEMP                                            AVSN2133
      3200 CONTINUE                                                    AVSN2134
           DO 3600 I = 1,NT                                            AVSN2135
           IF(TRUCK(I).LE.20) GO TO 3300                               AVSN2136
           IF(TRUCK(I).LE.30) GO TO 3400                               AVSN2137
           IF(TRUCK(I).LE.40) GO TO 3500                               AVSN2138
           NTRKS(4)=NTRKS(4)+1                                         AVSN2139
           GO TO 3600                                                  AVSN2140
      3300 NTRKS(1) = NTRKS(1) + 1                                     AVSN2141
           GO TO 3600                                                  AVSN2142
      3400 NTRKS(2) = NTRKS(2) + 1                                     AVSN2143
           GO TO 3600                                                  AVSN2144
      3500 NTRKS(3) = NTRKS(3) + 1                                     AVSN2145
      3600 CONTINUE                                                    AVSN2146
      C                                                                AVSN2147
           WRITE(6,604)                                                AVSN2148
           DO 4400 JX=1,NT                                             AVSN2149
           I=TRUCK(JX)                                                 AVSN2150
           ITYPE=1                                                     AVSN2151
           IF(I.GT.PTTRK(2)) ITYPE=2                                   AVSN2152
           IF(I.GT.PTTRK(3)) ITYPE=3                                   AVSN2153
           IF(I.GT.PTTRK(4)) ITYPE=4                                   AVSN2154
           IVEH=I-PTTRK(ITYPE)                                         AVSN2155
           WRITE(6,605) JX,TYPE(ITYPE),IVEH,CAPAC(I),RTLIM(I)          AVSN2156
           IF((JX-(JX/5)*5).EQ.0) WRITE(6,606)                         AVSN2157
      4400 CONTINUE                                                    AVSN2158
           RETURN                                                      AVSN2159
       500 FORMAT(I6)                                                  AVSN2160
       501 FORMAT(F5.1)                                                AVSN2161
       502 FORMAT(I1)                                                  AVSN2162
       503 FORMAT(I2,1X,A6,1X,A6)                                      AVSN2163
       504 FORMAT(A6,1X,I2,1X,I2,1X,I2,1X,I3)                         AVSN2164
       505 FORMAT(A1,I2,1X,I2,1X,I2)                                   AVSN2165
       600 FORMAT(1H1///13X,26(1H-)/13X,26H AVS REGULAR ORDER PROGRAM/ AVSN2166
          *       13X,26(1H-))                                         AVSN2167
       601 FORMAT(////20X,I2,1H/,I2,1H/,I2//21X,F6.1//21X,5H(OPT=,I1,1H)) AVSN2168
       602 FORMAT(//20X,6(1H-)/20X,5HORDERS/20X,6(1H-)/)               AVSN2169
       603 FORMAT( 8X,I2,3X,I2,14H PALLETS FROM ,A6,4H TO ,A6)         AVSN2170
       604 FORMAT(/20X,17(1H-)/20X,17HVEHICLES SELECTED                AVSN2171
          *      /20X,17(1H-)/)                                       AVSN2172
       605 FORMAT(4X,I2,1X,8HVEHICLE  ,A2,I2,12H CAPACITY = ,I3,       AVSN2173
          *    8H PALLETS, 19H, ROUTE DURATION = ,F6.1,6H MINS. )     AVSN2174
       606 FORMAT(1H0)                                                 AVSN2175
           END                                                         AVSN2176
```

ROUTINE: AVSOUT

ARGUMENT:

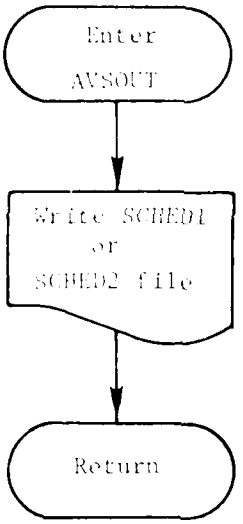
L - Disk unit number of SCHED file

1, SCHED1

2, SCHED2

Description:

AVSOUT creates SCHED1 or SCHED2 from the order lists and other variable values at the completion of each run.



```
      SUBROUTINE AVSOUT(L)                                              AVSOUT 2
C                                                                       AVSOUT 3
C*****************************************************************    AVSOUT 4
C                                                                       AVSOUT 5
C     AVSOUT CREATES UPDATE FILES TO BE USED BY NEXT AVS2 RUN           AVSOUT 6
C                                                                       AVSOUT 7
C*****************************************************************    AVSOUT 8
C                                                                       AVSOUT 9
      INTEGER PTSOR,CAPAC,TRUCK,DATE,PTTRK,ONUMB                        AVSOUT10
      INTEGER TRKSAV,SORDR                                              AVSOUT11
      ALPHA WHNAM                                                       AVSOUT12
      REAL LTIME                                                        AVSOUT13
      COMMON                                                            AVSOUT14
     */SAVEP/ NSAV(4),TRKSAV(4)                                         AVSOUT15
     */SPORD/ ICNTRL,SAVTIM,SORDR                                       AVSOUT16
     */WHINTG/ NWARE,NAREA(16)                                          AVSOUT17
     */SCHEDL/ ONUMB(200),INFO(200),IDESTP(200),IAREA(200),LFRWD(200),  AVSOUT18
     *LBKWD(200),LCFWD(200),LCBWD(200),ATIME(200),STOPT(200)            AVSOUT19
     */TRUCKS/ PTSOR(50),TRUCK(50),CAPAC(50),STIME(50),LTIME(50),       AVSOUT20
     * RTLIM(50),TLEFT(50),NT                                          AVSOUT21
     */WHOUSE/ WHNAM(92)                                               AVSOUT22
     */TIMTAB/ TTIME(3,45),TTIM2(6)                                    AVSOUT23
     */NSCLNS/ NORDR,NTRKS(4),PTTRK(4)                                 AVSOUT24
     */IAOPT/ SHIFT,DATE                                               AVSOUT25
      REWIND L                                                          AVSOUT26
      DO 200 I=1,4                                                      AVSOUT27
      IF(TRKSAV(I).GE.0) PTTRK(I)=TRKSAV(I)                             AVSOUT28
  200 NTRKS(I)=NTRKS(I)+NSAV(I)                                         AVSOUT29
      NT= NTRKS(1)+NTRKS(2)+NTRKS(3)                                    AVSOUT30
      NT=NT+NTRKS(4)                                                    AVSOUT31
      WRITE(L,102) NWARE,(NAREA(I),I=1,16),(WHNAM(I),I=1,NWARE)         AVSOUT32
      WRITE(L,100) (ONUMB(I),INFO(I),IDESTP(I),IAREA(I),                AVSOUT33
     * LFRWD(I),LBKWD(I),LCFWD(I),LCBWD(I),ATIME(I),STOPT(I),           AVSOUT34
     * I=1,200)                                                         AVSOUT35
      WRITE(L,101) (PTSOR(I),TRUCK(I),CAPAC(I),STIME(I),LTIME(I),       AVSOUT36
     * RTLIM(I),TLEFT(I),I=1,50)                                       AVSOUT37
      WRITE(L,104) ((TTIME(I,J),I=1,3),J=1,45),TTIM2                    AVSOUT38
      WRITE(L,105) PTTRK,NTRKS,NORDR ,SORDR                             AVSOUT39
      WRITE(L,106) SHIFT,DATE                                           AVSOUT40
      MARK=999                                                          AVSOUT41
      WRITE(L,107) MARK                                                 AVSOUT42
      ENDFILE L                                                         AVSOUT43
      RETURN                                                            AVSOUT44
  100 FORMAT(8I8,2F6.1)                                                 AVSOUT45
  101 FORMAT(3I8,4F6.1)                                                 AVSOUT46
  102 FORMAT(10I8/7I8/(1X,10A6))                                        AVSOUT47
  104 FORMAT(3F6.1)                                                     AVSOUT48
  105 FORMAT(4I8/4I8/2I8)                                               AVSOUT49
  106 FORMAT(F6.1,I8)                                                   AVSOUT50
  107 FORMAT(I6)                                                        AVSOUT51
      END                                                               AVSOUT52
```

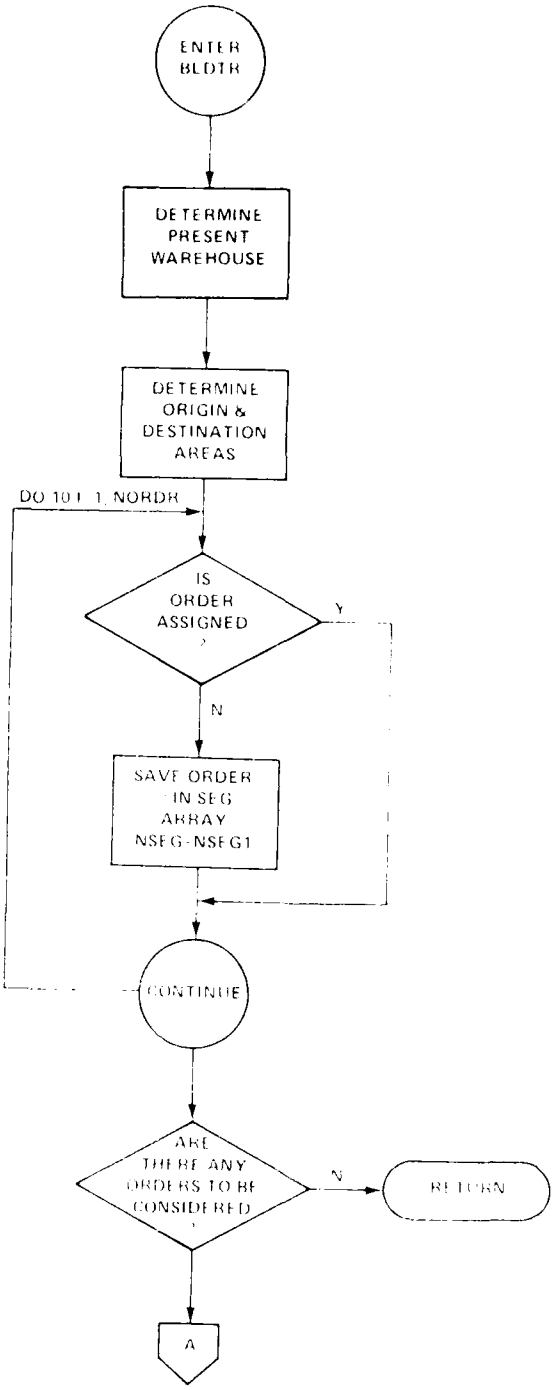
ROUTINE: BLDTR

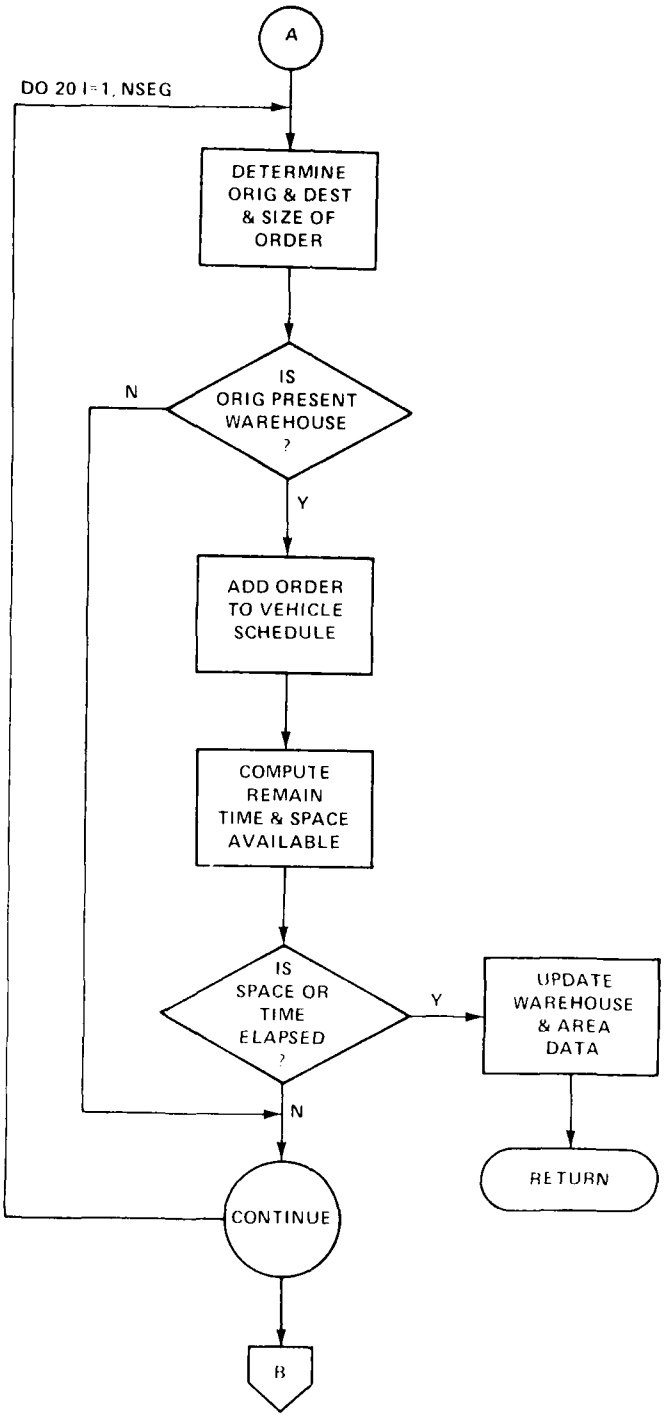
ARGUMENTS:

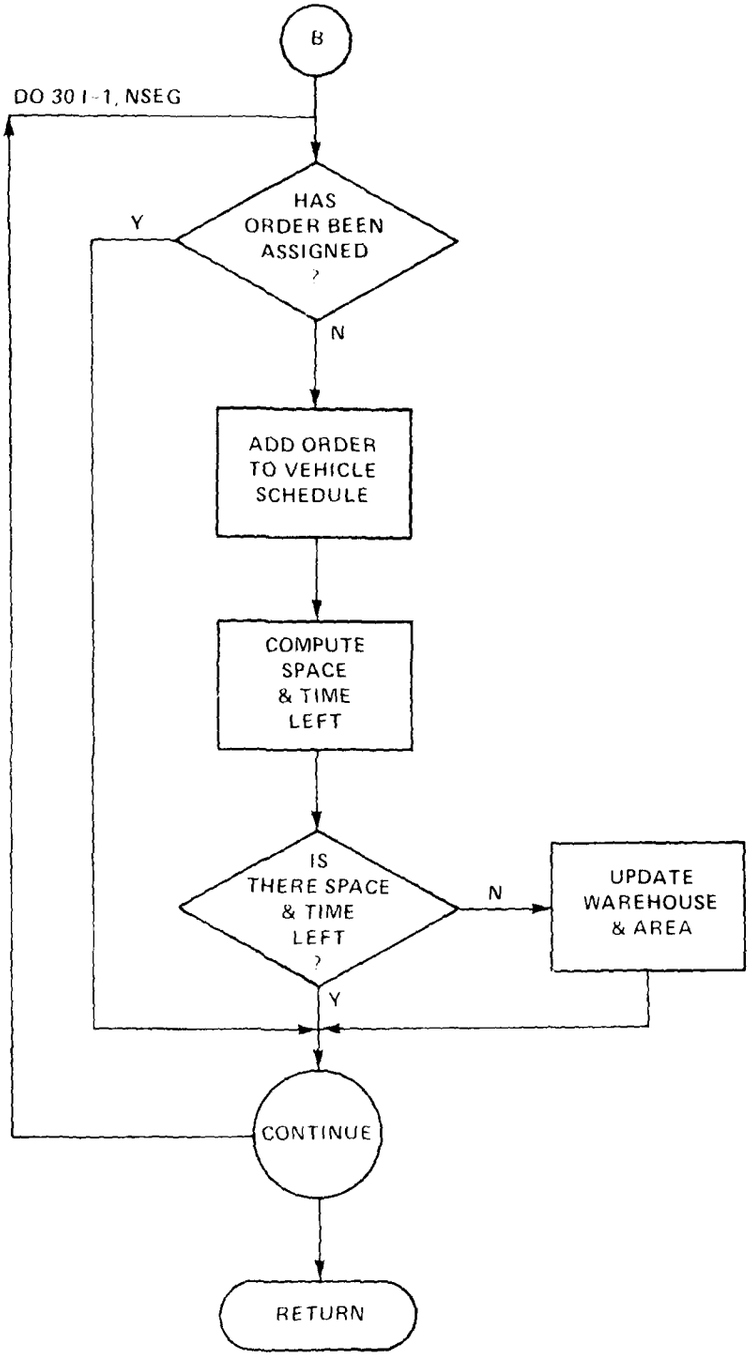
IFILL - Number of order parts assigned to the schedule segment
(Sign of IFILL indicates direction of delivery)
IRCAP - Remaining vehicle capacity given in pallets
LSTORD - List number of last order added to route segment

Description:

BLDTR builds schedule segments considering space available on the vehicle and the sequence of order delivery for specified origin and destination areas. Orders selected are set negative and linked to the vehicle list. IFILL is decremented and IRCAP is reduced by the size of the order loaded. BLDTR assigns orders to the vehicle in a "first on, last off" manner.


ENTER BLDTR
DETERMINE PRESENT WAREHOUSE
DETERMINE ORIGIN & DESTINATION AREAS
DO 101 I, NORDR
IS ORDER ASSIGNED ?
Y
N
SAVE ORDER IN SEG ARRAY NSEG=NSEG1
CONTINUE
ARE THERE ANY ORDERS TO BE CONSIDERED ?
N
RETURN
A


A
DO 20 I=1, NSEG
DETERMINE ORIG & DEST & SIZE OF ORDER
IS ORIG PRESENT WAREHOUSE ?
N
Y
ADD ORDER TO VEHICLE SCHEDULE
COMPUTE REMAIN TIME & SPACE AVAILABLE
IS SPACE OR TIME ELAPSED ?
Y
UPDATE WAREHOUSE & AREA DATA
N
RETURN
CONTINUE
B


B
DO 30 I = 1, NSEG
HAS ORDER BEEN ASSIGNED ?
Y
N
ADD ORDER TO VEHICLE SCHEDULE
COMPUTE SPACE & TIME LEFT
IS THERE SPACE & TIME LEFT ?
N
UPDATE WAREHOUSE & AREA
Y
CONTINUE
RETURN

```
  SUBROUTINE BLOTR      74/74   OPT=0 ROUND=*/ TRACE          FTN 4.6+460        12/12/80  08.07.55

 1                SUBROUTINE BLOTR(IFILL,IRCAP,LSTORD)                                  BLOTR      2
                C*************************************************************          BLOTR      3
                C     THIS SUBROUTINE BUILDS SCHEDULES SEGMENTS BY USING              BLOTR      4
                C     THE TRANSPORTER TRUCK ORDER OF LOAD / UNLOAD                    BLOTR      5
 5              C---------------------------- FIRST ON - LAST OFF ---------------------BLOTR      6
                C                                                                     BLOTR      7
                C     ITRUCK - CURRENT VEHICLE NO                                     BLOTR      8
                C     ITYPE - VEHICLE TYPE                                            BLOTR      9
                C     LASTW - LAST WHOUSE VISITED                                     BLOTR     10
10              C     LASTA - LAST AREA VISITED                                       BLOTR     11
                C     NEXTA - NEXT AREA TO BE VISITED                                 BLOTR     12
                C*************************************************************          BLOTR     13
                C                                                                     BLOTR     14
                      INTEGER ONUMB,TRUCK,PTR<                                        BLOTR     15
15                    INTEGER SORDR(20),CAPAC,PTSOR                                   BLOTR     16
                      INTEGER SPLTSW(3)                                               BLOTR     17
                      ALPHA WHNAM                                                     B1212      1
                      REAL LTIME                                                      BLOTR     19
                      COMMON                                                          BLOTR     20
20                   */GEN/ RTTIM,MINLD(4)                                            BLOTR     21
                     */SCHEDL/ ONUMB(200),INF)(200),IDESTP(200),IAREA(200),LFRMD(200),BLOTR     22
                     *LBKWD(200),LCFWD(200),LCBWD(200),ATIME(200),STOPT(200)          BLOTR     23
                     */TRUCKS/ PTSOR(50),TRUC<(50),CAPAC(50),STIME(50),LTIME(50),     BLOTR     24
                     *RTLIM(50),TLEFT(50),NT                                          BLOTR     25
25                   */MSGLNS/ NORDR,NTRKS(4),PTTR<(4)                                BLOTR     26
                     */BLDS/ LASTW,LASTA,NEXTA,ITRUCK,ITYPE,IPASS,NPALTS,TIME         BLOTR     27
                     */SPORD/ ICNTRL,SAVTIM,ISORD                                     BLOTR     28
                     */WHOUSE/ WHNAM(92)                                              BLOTR     29
                     */SPLIT/ NSPLIT                                                  BLOTR     30
30                   */LOADSV/ LOAD                                                   BLOTR     31
                      NPALTS=0                                                        BLOTR     32
                      MSPLIT=NSPLIT                                                   BLOTR     33
                      LSTORD=0                                                        BLOTR     34
                      ISTART=1                                                        BLOTR     35
35                    IEND=NORDR                                                      BLOTR     36
                C     NSEG - NO ORDERS ON SCHEDULE SEGMENT                            BLOTR     37
                C     SORDR - SAVE ORDERS OF SEGMENT                                  BLOTR     38
                   26 NSEG=0                                                          BLOTR     39
                      ITSUM=LOAD                                                      BLOTR     40
40                    JAREA= LASTA*100+NEXTA                                          BLOTR     41
                      DO 100 I=ISTART,IEND                                            BLOTR     42
                      IF(IPASS.GT.2) GO TO 35                                         BLOTR     43
                      IF(ONUMB(I).GE.0) GO TO 100                                     BLOTR     44
                      IF(ONUMB(I).GT.(-100)) GO TO 100                                BLOTR     45
45                 35 IF(INFO(I).LE.0) GO TO 100                                      BLOTR     46
                      IF(JAREA.NE.IAREA(I)) GO TO 100                                 BLOTR     47
                      ID=INFO(I)/10000                                                BLOTR     48
                      IT=MOD(INFO(I)/100,100)                                         BLOTR     49
                      IF(NOW(ITYPE,WHNAM(ID),WHNAM(IT)).EQ.1) GO TO 100               BLOTR     50
50                 75 NSEG=NSEG+1                                                     BLOTR     51
                      ITSUM=ITSUM+MOD(INFO(I),100)                                    BLOTR     52
                      SORDR(NSEG)= I                                                  BLOTR     53
                  100 CONTINUE                                                        BLOTR     54
                      ITSAVE=0                                                        BLOTR     55
55                    JAREA=NEXTA*100+NEXTA                                           BLOTR     56
                      IF(NSEG.LE.0) RETURN                                            BLOTR     57
                      IF(NSEG.NE.1) GO TO 101                                         BLOTR     58
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```
                      IORD=SORDR(1)                                          RLOTR      59
                      ITSUM=MOD(INFO(IORD),100)                              RLOTR      60
   60                 GO TO 102                                              RLOTR      61
                  101 DO 175 I=1,NSEG                                        RLOTR      62
                      IORD=SORDR(I)                                          RLOTR      63
                      IT=MOD(INFO(IORD)/100,100)                             RLOTR      64
                      DO 180 II=1,NORDR                                      RLOTR      65
   65                 IF(IORD.EQ.II) GO TO 181                               RLOTR      66
                      IT=MOD(INFO(IORD)/100,100)                             RLOTR      67
                      IF(INFO(II)/10000.NE.IT) GO TO 180                     RLOTR      68
                      IF(MOD(IAREA(II),100).NE.NEXTA) GO TO 180              RLOTR      69
                      IF(ITSAVE.EQ.0) GO TO 185                              RLOTR      70
   70                 IF(ITSAVE.EQ.IT) GO TO 175                             RLOTR      71
                  185 ISUM=0                                                 RLOTR      72
                      DO 181 K=1,NORDR                                       RLOTR      73
                      IF(INFO(K).LE.0) GO TO 181                             RLOTR      74
                      IF(JAREA.NE.IAREA(K)) GO TO 181                        RLOTR      75
   75                 ISUM=ISUM+MOD(INFO(K),100)                             RLOTR      76
                  181 CONTINUE                                               RLOTR      77
                      IF(ISUM.LT.MINLO(ITYPE)) GO TO 180                     RLOTR      78
                      ITSAVE=IT                                              RLOTR      79
                      IF(MOD(IPASS,2).EQ.0) IPASS=IPASS-1                    RLOTR      80
   80                 MSEG=I                                                 RLOTR      81
                  186 MSEG=MSEG-1                                            RLOTR      82
                      IF(MSEG.LE.0) GO TO 175                                RLOTR      83
                      JORD=SORDR(MSEG)                                       RLOTR      84
                      IF(MOD(INFO(JORD)/100,100).EQ.IT) GO TO 186            RLOTR      85
   85                 ITSUM=ITSUM-MOD(INFO(JORD),100)                        RLOTR      86
                      SORDR(MSEG)=0                                          RLOTR      87
                      GO TO 186                                              RLOTR      88
                  180 CONTINUE                                               RLOTR      89
                  175 CONTINUE                                               RLOTR      90
   90             102 IF(ITSUM.GE.MINLO(ITYPE)) GO TO 103                    RLOTR      91
                      IF(NEXTA.EQ.LASTA) RETURN                              RLOTR      92
                      IF(MOD(IPASS,2).NE.0) RETURN                           RLOTR      93
                  103 CONTINUE                                               RLOTR      94
                C     CONSIDER FIRST ORDERS WHERE ORIGIN =LASTA              RLOTR      95
   95                 JSAV=0                                                 RLOTR      96
                      LIM=0                                                  RLOTR      97
                      IF(NSEG.EQ.1) GO TO 950                                RLOTR      98
                      MSEG=NSEG-1                                            RLOTR      99
                      DO 800 I=1,MSEG                                        RLOTR     100
  100                 IF(SORDR(I).LE.0) GO TO 800                            RLOTR     101
                      IORD=SORDR(I)                                          RLOTR     102
                      ISTART=I+1                                             RLOTR     103
                      DO 800 J=ISTART,NSEG                                   RLOTR     104
                      IF(SORDR(J).LE.0) GO TO 800                            RLOTR     105
  105                 JORD=SORDR(J)                                          RLOTR     106
                      IF(MOD(INFO(IORD),100).GE.MOD(INFO(JORD),100)) GO TO 801 RLOTR     107
                      SORDR(I)=JORD                                          RLOTR     108
                      SORDR(J)=IORD                                          RLOTR     109
                      IORD=JORD                                              RLOTR     110
  110             800 CONTINUE                                               RLOTR     111
                  900 CONTINUE                                               RLOTR     112
                  950 DO 1000 I=1,3                                          RLOTR     113
                 1000 SPLTSW(I)=0                                            RLOTR     114
                      DO 1100 I=1,NSEG                                       RLOTR     115
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115                IF(SORDR(I).LE.0) GO TO 1100                                  RLOTR  116
                    IORDR=SORDR(I)                                               RLOTR  117
                   ISIZE=MOD(INFO(IORDR),100)                                    RLOTR  118
                   IF(ISIZE.EQ.IRCAP) SPLTSM(1)=SPLTSM(1)+ISIZE                  RLOTR  119
                   IF(ISIZE.LT.IRCAP) SPLTSM(2)=SPLTSM(2)+ISIZE                  RLOTR  120
120                SPLTSM(3)=SPLTSM(3)+ISIZE                                     RLOTR  121
                1100 CONTINUE                                                    RLOTR  122
                   SPLTSM(3)=SPLTSM(1)+SPLTSM(2)                                 RLOTR  123
                   NOEST=0                                                       RLOTR  124
                   DO 2000 ISPLIT=1,NSPLIT                                       RLOTR  125
125                IF(NEXTA.EQ.LASTA.AND.SPLTSM(ISPLIT).LT.MINLD(ITYPE)) GO TO 2000  RLOTR  126
                   DO 200 I=1,NSORG                                              RLOTR  127
                   IF(SORDR(I).LE.0) GO TO 200                                   RLOTR  128
                   IORDR=SORDR(I)                                                RLOTR  129
                   IF(INFO(IORDR)/10000.NE.LASTW) GO TO 200                      RLOTR  130
130             C     ENOUGH PALLETS                                             RLOTR  131
                   IPLTS=MOD(INFO(IORDR),100)                                    RLOTR  132
                   GO TO (2001,2002,2003),ISPLIT                                 RLOTR  133
                2001 IF(IPLTS.EQ.IRCAP) GO TO 300                                RLOTR  134
                   GO TO 200                                                     RLOTR  135
135                2002 IF(IPLTS.GT.IRCAP) GO TO 200                             RLOTR  136
                   GO TO 300                                                     RLOTR  137
                2003 IF(IPLTS.LE.IRCAP) GO TO 300                                RLOTR  138
                   IF(NEXTA.NE.LASTA) GO TO 305                                  RLOTR  139
                   IF(NOEST.EQ.0) NOEST =MOD(INFO(IORDR)/100,100)                RLOTR  140
140                 IF(NOEST.NE.MOD(INFO(IORDR)/100,100)) GO TO 200              RLOTR  141
                 305 ISAVE=IPLTS-IRCAP                                           RLOTR  142
                C     FORM NEW INFO/ORDER ELEMENT                                RLOTR  143
                   INFO(IORDR)=INFO(IORDR)/100*100+ISAVE                         RLOTR  144
                   NORDR=NORDR+1                                                 RLOTR  145
145                IAREA(NORDR)=IAREA(IORDR)                                     RLOTR  146
                   INFO(NORDR)=-(INFO(IORDR)/100*100+IRCAP)                      RLOTR  147
                   ONUMB(IORDR)=-IABS(ONUMB(IORDR))                              RLOTR  148
                   ONUMB(NORDR)=ONUMB(IORDR)                                     RLOTR  149
                   NPALTS=NPALTS+IRCAP                                           RLOTR  150
150             C     COMPUTE THE TIME REMAINING FOR VEHICLE                     RLOTR  151
                   TLEFT(ITRUCK)=TLEFT(ITRUCK)-(TIME+2.*(LTIME(ITRUCK)*FLOAT(IPCAP)  RLOTR  152
                  1* STIME(ITRUCK)))                                             RLOTR  153
                   IPCAP=0                                                       RLOTR  154
                C     LINK SEGMENT TO SCHEDULE                                   RLOTR  155
155                LSTART=NORDR                                                  RLOTR  156
                   IF(PTSOR(ITRUCK).LE.0) PTSOR(ITRUCK)=NORDR                    RLOTR  157
                   LSTART=PTSOR(ITRUCK)                                          RLOTR  158
                   ISAVE=LSTART                                                  RLOTR  159
                   LINK=LFWD(LSTART)                                             RLOTR  160
160                325 IF(LINK.LE.0) GO TO 350                                   RLOTR  161
                   ISAVE=LINK                                                    RLOTR  162
                   LINK=LFWD(LINK)                                               RLOTR  163
                   GO TO 325                                                     RLOTR  164
                 350 IF(ISAVE.EQ.NORDR) GO TO 360                                RLOTR  165
165                LFWD(ISAVE)=NORDR                                             RLOTR  166
                   LFWD(NORDR)=ISAVE                                             RLOTR  167
                 360 IFILL=IFILL-1                                               RLOTR  168
                   IDEST(NORDR)=IFILL                                            RLOTR  169
                   IF(IFILL.EQ.(-1)) GO TO 370                                   RLOTR  170
170                TLEFT(ITRUCK)=TLEFT(ITRUCK)+TIME                              RLOTR  171
                 370 IDEST=MOD(IABS(INFO(NORDR))/100,100)                        RLOTR  172
```

```
                      IF(LTW.LE.0) LTW=IDEST                                    RLOTR     173
                      IF(JSAVE.EQ.0) JSAVE=IDEST                                RLOTR     174
                      IF(JSAVE.NE.IDEST) TLEFT(ITRUCK)=TLEFT(ITRUCK)-2.         RLOTR     175
  175                 LASTA=NEXTA                                               RLOTR     176
                      LASTW=LTW                                                 RLOTR     177
                      RETURN                                                    RLOTR     178
                  300 IF(NEXTA.NE.LASTA) GO TO 375                              RLOTR     179
                      IF(NDEST.EQ.0) NDEST=MOD(INFO(IORDR)/100,100)             RLOTR     180
  180                 IF(NDEST.NE.MOD(INFO(IORDR)/100,100)) GO TO 200           RLOTR     181
                  375 IFILL=IFILL-1                                             RLOTR     182
                      NPALTS=NPALTS+IPLTS                                       RLOTR     183
                      IRCAP=IRCAP-IPLTS                                         RLOTR     184
                      IDEST=MOD(INFO(IORDR)/100,100)                            RLOTR     185
  185             C   COMPUTE TIME REMAINING FOR VEHICLE                       RLOTR     186
                      TLEFT(ITRUCK)=TLEFT(ITRUCK)-(TIME+2.*(STIME(ITRUCK)+LTIME(ITRUCK)  RLOTR     187
                     1 *FLOAT(IPLTS)))                                          RLOTR     188
                      IF(JSAVE.EQ.0) JSAVE=IDEST                                RLOTR     189
                      IF(JSAVE.NE.IDEST) TLEFT(ITRUCK)=TLEFT(ITRUCK)-2.         RLOTR     190
  190                 JSAVE=IDEST                                               RLOTR     191
                      IF(IFILL.EQ.(-1)) GO TO 330                               RLOTR     192
                      TLEFT(ITRUCK)=TLEFT(ITRUCK)+TIME                          RLOTR     193
                  C   LINK SEGMENT TO SCHEDULE                                  RLOTR     194
                  380 INFO(IORDR)=-INFO(IORDR)                                  RLOTR     195
  195                 IF(LTW.LE.0) LTW=IDEST                                    RLOTR     196
                      IDESTP(IORDR)=IFILL                                       RLOTR     197
                      LSTO=0=IORDR                                              RLOTR     198
                      IF(PTSOR(ITRUCK).LE.0) PTSOR(ITRUCK)=IORDR                RLOTR     199
                      LASTA=PTSOR(ITRUCK)                                       RLOTR     200
  200                 ISAVE=LSTART                                              RLOTR     201
                      LINK=LFRWD(LSTART)                                        RLOTR     202
                  410 IF(LINK.LE.0) GO TO 400                                   RLOTR     203
                      ISAVE=LINK                                                RLOTR     204
                      LINK=LFRWD(LINK)                                          RLOTR     205
  205                 GO TO 410                                                 RLOTR     206
                  400 IF(ISAVE.EQ.IORDR) GO TO 420                              RLOTR     207
                      LFRWD(ISAVE)=IORDR                                        RLOTR     208
                      LAKWD(IORDR)=ISAVE                                        RLOTR     209
                  420 IF(IRCAP.LE.0) GO TO 421                                  RLOTR     210
  210                 IF(TLEFT(ITRUCK).LE.0.0) GO TO 421                        RLOTR     211
                      IF(MOD(IPASS,2).EQ.0) GO TO 200                           RLOTR     212
                      ITEST=NEXTA*100+NEXTA                                     RLOTR     213
                      DO 425 JJ=1,NORDR                                         RLOTR     214
                      IF(IARC(JJ).NE.ITEST) GO TO 425                           RLOTR     215
  215                 IF(INFO(JJ)/10000.NE.LTW) GO TO 426                       RLOTR     216
                      GO TO 421                                                 RLOTR     217
                  425 CONTINUE                                                  RLOTR     218
                      GO TO 200                                                 RLOTR     219
                  421 LASTW=NEXTA                                               RLOTR     220
  220                 LASTW=LTW                                                 RLOTR     221
                      RETURN                                                    RLOTR     222
                  200 CONTINUE                                                  RLOTR     223
                 2000 CONTINUE                                                  RLOTR     224
                      NOFST=0                                                   RLOTR     225
  225                 DO 5000 ISPLIT=1,NSPLIT                                   RLOTR     226
                      IF(NEXTA.EQ.LASTA.AND.SPLTS4(ISPLIT).LT.MINL(ITYPE)) GO TO 5001  RLOTR     227
                      DO 510 I=1,NS,6                                           RLOTR     228
                      IORD=SORDR(I)                                             RLOTR     229
```

```
                      IF(IORDR.EQ.0) GO TO 501                                  BLDTR   231
230                   IF(INFO(IORDR).LE.0) GO TO 500                            BLDTR   231
                C     ENOUGH PALLETS                                            BLDTR   232
                      IPLTS=MOD(INFO(IORDR),100)                                BLDTR   233
                      GO TO (5001,5002,5003),ISPLIT                             BLDTR   234
                5001  IF(IPLTS.EQ.IRCAP) GO TO 600                             BLDTR   235
235                   GO TO 500                                                 BLDTR   236
                5002  IF(IPLTS.GT.IRCAP) GO TO 500                              BLDTR   237
                      GO TO 601                                                 BLDTR   238
                5003  IF(IPLTS.LE.IRCAP) GO TO 600                              BLDTR   239
                      IF(NEXTA.NE.LASTA) GO TO 605                              BLDTR   241
240                   IF(NDEST.EQ.0) NDEST =MOD(INFO(IORDR)/100,100)            BLDTR   241
                       IF(NDEST.NE.MOD(INFO(IORDR)/100,100)) GO TO 500          BLDTR   242
                 605  ISAVE=IPLTS-IRCAP                                         BLDTR   243
                C     FORM NEW INFO/ORDER ELEMENTS                              BLDTR   244
                      INFO(IORDR)=INFO(IORDR)/100*100+ISAVE                     BLDTR   245
245                   NORDR=NORDR+1                                             BLDTR   246
                      INFO(NORDR)=-(INFO(IORDR)/100*100+IRCAP)                  BLDTR   247
                      ONUM3(IORDR)=-IABS(ONUM3(IORDR))                          BLDTR   248
                      ONUM3(NORDR)=ONUM3(IORDR)                                 BLDTR   249
                      IAREA(NORDR)=IAREA(IORDR)                                 BLDTR   250
250                   NPALTS=NPALTS+IRCAP                                       BLDTR   251
                C      COMPUTE THE TIME REMAINING FOR VEHICLE                   BLDTR   252
                      TLEFT(ITRUCK)=TLEFT(ITRUCK)-(TIME+2.*(LTIME(ITRUCK)*FLOAT(IRCAP)  BLDTR   253
                     1+ STIME(ITRUCK)))                                         BLDTR   254
                      IRCAP=0                                                   BLDTR   255
255             C      LINK SEGMENT TO SCHEDULE                                 BLDTR   256
                      LSTORD=NORDR                                              BLDTR   257
                      IF(PTSOR(ITRUCK).LE.0) PTSOR(ITRUCK)=NORDR                BLDTR   258
                      LSTART=PTSOR(ITRUCK)                                      BLDTR   259
                      ISAVE=LSTART                                              BLDTR   260
260                   LINK=LFRWD(LSTART)                                        BLDTR   261
                  625 IF(LINK.LE.0) GO TO 650                                   BLDTR   262
                      ISAVE=LINK                                                BLDTR   263
                      LINK=LFRWD(LINK)                                          BLDTR   264
                      GO TO 625                                                 BLDTR   265
265                   IF(ISAVE.EQ.NORDR) GO TO 660                              BLDTR   266
                      LFRWD(ISAVE)=NORDR                                        BLDTR   267
                      LBKWD(NORDR)=ISAVE                                        BLDTR   268
                  660 IFILL=IFILL-1                                             BLDTR   269
                      IDESTP(NORDR)=IFILL                                       BLDTR   270
270                   IF(IFILL.EQ.(-1)) GO TO  670                              BLDTR   271
                      TLEFT(ITRUCK)=TLEFT(ITRUCK)+TIME                          BLDTR   272
                  670 IDEST=MOD(IABS(INFO(NORDR))/100,100)                      BLDTR   273
                      IF(LTW.LE.0) LTW =IDEST                                   BLDTR   274
                      IF(JSAVE.EQ.0) JSAVE=IDEST                                BLDTR   275
275                   IF(JSAVE.NE.IDEST) TLEFT(ITRUCK)=TLEFT(ITRUCK)-2.         BLDTR   276
                      LASTA=NEXTA                                               BLDTR   277
                      LASTW=LTW                                                 BLDTR   278
                      RETURN                                                    BLDTR   279
                  600 IF(NEXTA.NE.LASTA) GO TO 675                              BLDTR   280
280                   IF(NDEST.EQ.0) NDEST=MOD(INFO(IORDR)/100,100)             BLDTR   281
                      IF(NDEST.NE.MOD(INFO(IORDR)/100,100)) GO TO 500           BLDTR   282
                  675 IFILL=IFILL-1                                             BLDTR   283
                      NPALTS=NPALTS+IPLTS                                       BLDTR   284
                      IRCAP=IRCAP-IPLTS                                         BLDTR   285
285                   IDEST=MOD(INFO(IORDR)/100,100)                            BLDTR   286
```

```
      SUBROUTINE ALOTR      74/74   OPT=0 ROUND=Y TRACE          FTN 5.0+453     12/12/80  09.07.55

                C     COMPUTE TIME REMAINING FOR VEHICLE                                    ALOTR     287
                      TLEFT(ITRUCK)=TLEFT(ITRUCK)-(TIME+2.*(STIME(ITRUCK)+LTIME(ITRUCK)     ALOTR     288
                     1 *FLOAT(IPLTS)))                                                      ALOTR     289
                      IF(JSAVE.EQ.0) JSAVE=IDEST                                            ALOTR     290
      293             IF(JSAVE.NE.IDEST) TLEFT(ITRUCK)=TLEFT(ITRUCK)-2.                     ALOTR     291
                      JSAVE=IDEST                                                           ALOTR     292
                      TLEFT(ITRUCK)=TLEFT(ITRUCK)+TIME                                      ALOTR     293
                C     LINK SEGMENT TO SCHEDULE                                              ALOTR     294
                  680 INFO(IORDR)=-INFO(IORDR)                                              ALOTR     295
      295             IF(LTW.LE.0) LTW=IDEST                                                ALOTR     296
                      IDESTP(IORDR)=IFILL                                                   ALOTR     297
                      LSTOP=IORDR                                                           ALOTR     298
                      IF(PTSOR(ITRUCK).LE.0) PTSOR(ITRUCK)=IORDR                            ALOTR     299
                      LSTART=PTSOR(ITRUCK)                                                  ALOTR     300
      500             ISAVE=LSTART                                                          ALOTR     301
                      LINK=LFRWD(LSTART)                                                    ALOTR     302
                  710 IF(LINK.LE.0) GO TO 700                                               ALOTR     303
                      ISAVE=LINK                                                            ALOTR     304
                      LINK=LFRWD(LINK)                                                      ALOTR     305
      305             GO TO 710                                                             ALOTR     306
                  700 IF(ISAVE.EQ.IORDR) GO TO 720                                          ALOTR     307
                      LFRWD(ISAVE)=IORDR                                                    ALOTR     308
                      LBKWD(IORDR)=ISAVE                                                    ALOTR     309
                  720 IF(IRCAP.LE.0) GO TO 721                                              ALOTR     310
      315             IF(TLEFT(ITRUCK).LE.0.0) GO TO 721                                    ALOTR     311
                      GO TO 500                                                             ALOTR     312
                  721 LASTA=NEXTA                                                           ALOTR     313
                      LASTW=LTW                                                             ALOTR     314
                      RETURN                                                                ALOTR     315
      315         5000 CONTINUE                                                             ALOTR     316
                      IF(NPALTS.LE.0) RETURN                                                ALOTR     317
                      LASTA=NEXTA                                                           ALOTR     318
                      LASTW=LTW                                                             ALOTR     319
                      RETURN                                                                ALOTR     320
                      END                                                                   ALOTR     321
```

```
BLOCK DATA BLKDAT.    74/74   OPT=0 ROUND=*/ TRACE          FTN 4.6+460        12/12/80  08.07.55

      BLOCK DATA                                                          BLOCK      2
      ALPHA                                                               A1212      4
     *      NORTH,CENTR,NSYN,WEST,NSYW,                                  BLOCK      4
     *     NSYC,NSYS,SOUTH,MCRFT,X54,                                    BLOCK      5
     *     ABASE,NWS,OEYTN,BRASW,CSNWS,NMEDC                             BLOCK      6
      INTEGER PTSOR,CAPAC,TRUCK,ONUMB                                     BLOCK      7
      INTEGER PTTRK                                                       BLOCK      8
      REAL LTIME                                                          BLOCK      9
      COMMON                                                              BLOCK     10
     */GEN/ RTTIM,MIN_D(4)                                                BLOCK     11
     */TIMTAB/ TTIME(3,,3),TTIM2(6)                                       BLOCK     12
     */WHRTG/ NWARE,NAREA(16)                                             BLOCK     13
     */SCHEDL/ ONUMB(200),INFO(200),IDESTP(200),IAREA(200),LFRWD(200),    BLOCK     14
     *LBKWD(200),LOFWD(200),LBAD(200),ATIME(200),STOPT(200)               BLOCK     15
     */TRUCKS/ PTSOR(50),TRUCK(50),CAPAC(50),STIME(50),LTIME(50),         BLOCK     16
     * RTLIM(50),TLEFT(50),NT                                            BLOCK     17
     */PTCLNC/ NORDR,NTRKS(4),PTTRK(4)                                    BLOCK     18
      COMMON /WHOUSE/                                                     BLOCK     19
     *      NORTH(14),CENTR(17),NSYN(3),WEST(3),NSYW(4),                 BLOCK     20
     *      NSYC(10),NSYS(12),SOUTH(13),MCRFT(6),X54,                    BLOCK     21
     *      ABASE, NWS, OEYTN, BRASW, CSNWS, NMEDC                       BLOCK     22
C                                                                         BLOCK     23
      DATA NAREA/14,17,9,3,4,10,12,10,6,7*1/                              BLOCK     24
      DATA NWARE /92/                                                     BLOCK     25
      DATA NORTH / 3H131, 5H16014, 5H16019, 4H1602,4H1603,                BLOCK     26
     *             4H1604, 4H1615, 4H1605, 4H1621, 4H1622 ,             BLOCK     27
     *     4H1628,1HA,4H1620,4H1157/                                     BLOCK     28
      DATA CENTR / 3H53C,3H64E,3H64W,3H66E,3H66W,3H67E,3H67W,             BLOCK     29
     *       3H198,4H1078,4H1127,2HSM,2H46,4H1138,                      BLOCK     30
     *     2H66,2H44,2HSF,3HSER/                                        BLOCK     31
      DATA NSYN / 1H2,1H3,1H5,1H8,2H35,3H43C,2H44,2H53,3H223/             BLOCK     32
      DATA WEST / 4H1502, 4H1503, 4H1507 /                                BLOCK     33
      DATA NSYW / 2H80,3H177,4H1143,4H1199 /                              BLOCK     34
      DATA NSYC / 2H98,3H187,3H216,3H218,4H1175,4H1169,                   BLOCK     35
     *           4H1171,4H1172,4H1173,4H1174 /                          BLOCK     36
      DATA NSYS /3HX10 ,3H193 ,3H224 ,1HL ,1HM ,1HN ,1HP ,1HQ ,          BLOCK     37
     *    1HR ,1HS ,1HT ,3HX21/                                         BLOCK     38
      DATA SOUTH / 2H30,3H43S,2H61,2H84,3H202,3H646,3H647,3H655          BLOCK     39
     * ,3H65C ,2H52/                                                    BLOCK     40
      DATA MCRFT / 1H1,1H7,2H16,2H23,2H2E,3H53S /                         BLOCK     41
      DATA X54 / 3HX54 /                                                  BLOCK     42
      DATA ABASE / 4HABASE /                                              BLOCK     43
      DATA NWS / 3HNWS /                                                  BLOCK     44
      DATA OEYTN / 5HOEYTN /                                              BLOCK     45
      DATA BRASW / 5HBRASW /                                              BLOCK     46
      DATA CSNWS / 5HCSNWS /                                              BLOCK     47
      DATA NMEDC / 5HNMEDC /                                              BLOCK     48
      DATA NTRKS/4*0/                                                     BLOCK     49
      DATA TRUCK / 50 * 0 /                                               BLOCK     50
      DATA PTTRK/0,20,30,40/                                              BLOCK     51
      DATA CAPAC/20*7,10*12,10*14,10*10/                                  BLOCK     52
      DATA LTIME / 20 * 0.2, 10 * 0.8, 20 * 1.7 /                         BLOCK     53
      DATA STIME / 20 * 1.7, 10 * 1.7, 20 * 5.0 /                         BLOCK     54
      DATA PTSOP / 50*0 /                                                 BLOCK     55
      DATA TTIME / 4..7..4..   11..9..6..   13..11..8..                  BLOCK     56
     *             13..11..8..   18..16..14..   23..21..19..            BLOCK     57
     *             30..28..25..   27..25..22..   31..29..26..            BLOCK     58
```

```
                *             7..5..4..  6..4..4..  7..5..4..                    BLOCK
                *             9..7..5..  12..10..7..  20..18..15..              BLOCK
60              *             26..24..21..  29..27..24..                         BLOCK
                *             8..6..4..  7..5..4..  9..7..5..                    BLOCK
                *             14..12..9..  22..20..17..  26..24..20..            BLOCK
                *             29..27..24..                                       BLOCK
                *             9..7..4..  12..10..7..  20..18..15..               BLOCK
65              *             26..24..21..  28..26..23..  32..30..27..           BLOCK
                *             6..4..4..  11..9..6..  16..14..12..                BLOCK
                *             21..19..17..  24..22..20..                         BLOCK
                *             8..6..5..  14..12..9..  15..13..10..               BLOCK
                *             18..16..14..                                       BLOCK
70              *             9..7..5..  11..9..6..  12..10..9..                 BLOCK
                *             8..5..4..  12..7..6..                              BLOCK
                *             7..5..5. /                                         BLOCK
                DATA TTIM2 / 30.. 45.. 30.. 25.. 35.. 15. /                      BLOCK
                DATA ONUMB / 200*0 /                                             BLOCK
75              DATA INFO/200*0/                                                 BLOCK
                DATA IAREA/200*0/                                                BLOCK
                DATA IDESTP/200*0/                                               BLOCK
                DATA LFRWD / 200*0 /                                             BLOCK
                DATA LBKWD / 200*0 /                                             BLOCK
80              DATA LCFWD / 200*0 /                                             BLOCK
                DATA LCBWD / 200*0 /                                             BLOCK
                DATA ATIME / 200*0. /                                            BLOCK
                DATA STOPT / 200*0. /                                            BLOCK
                DATA RTTIM/480.0/                                                BLOCK
85              DATA MINLD/5,8,14,6/                                             BLOCK
                END                                                              BLOCK
```

ROUTINE: BUILDS

ARGUMENTS:

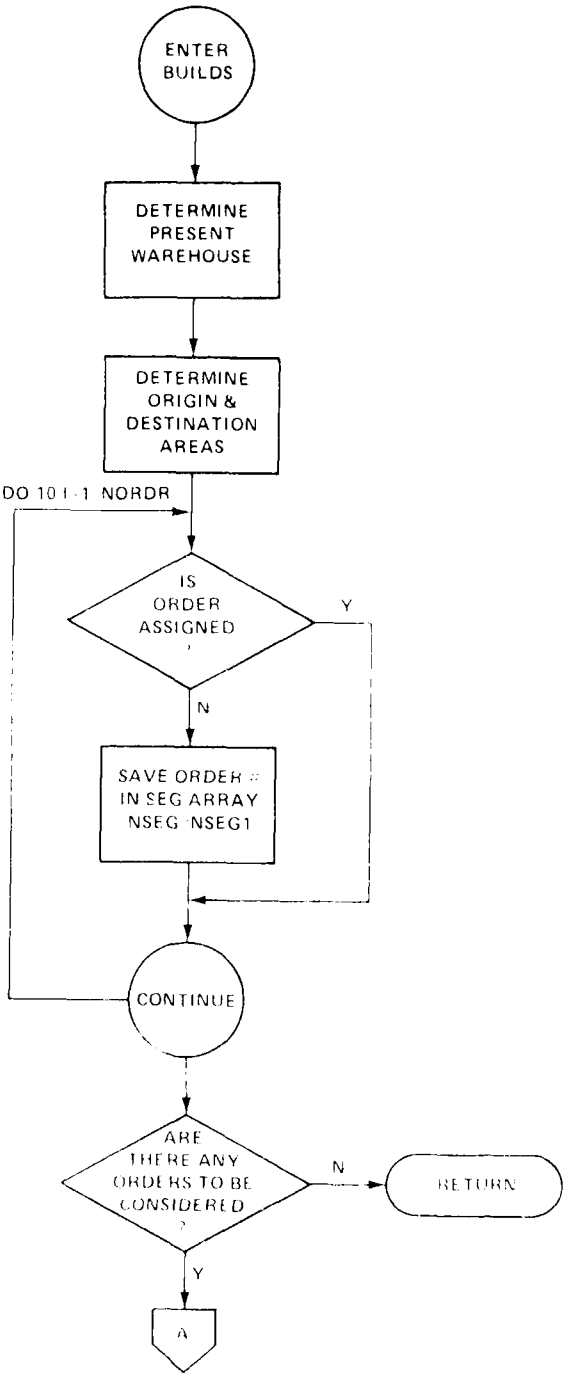
IFILL - Number of order parts assigned to schedule segment

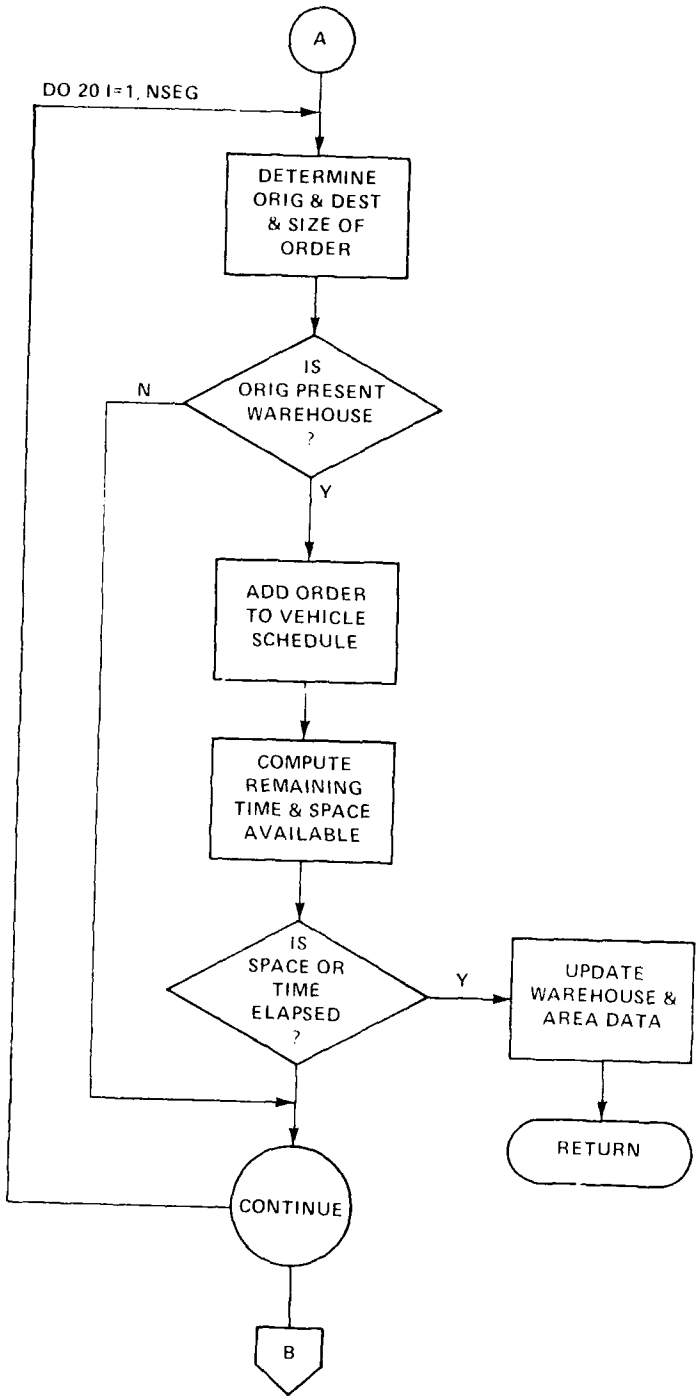
IRCRP - Remaining vehicle capacity given in pallets

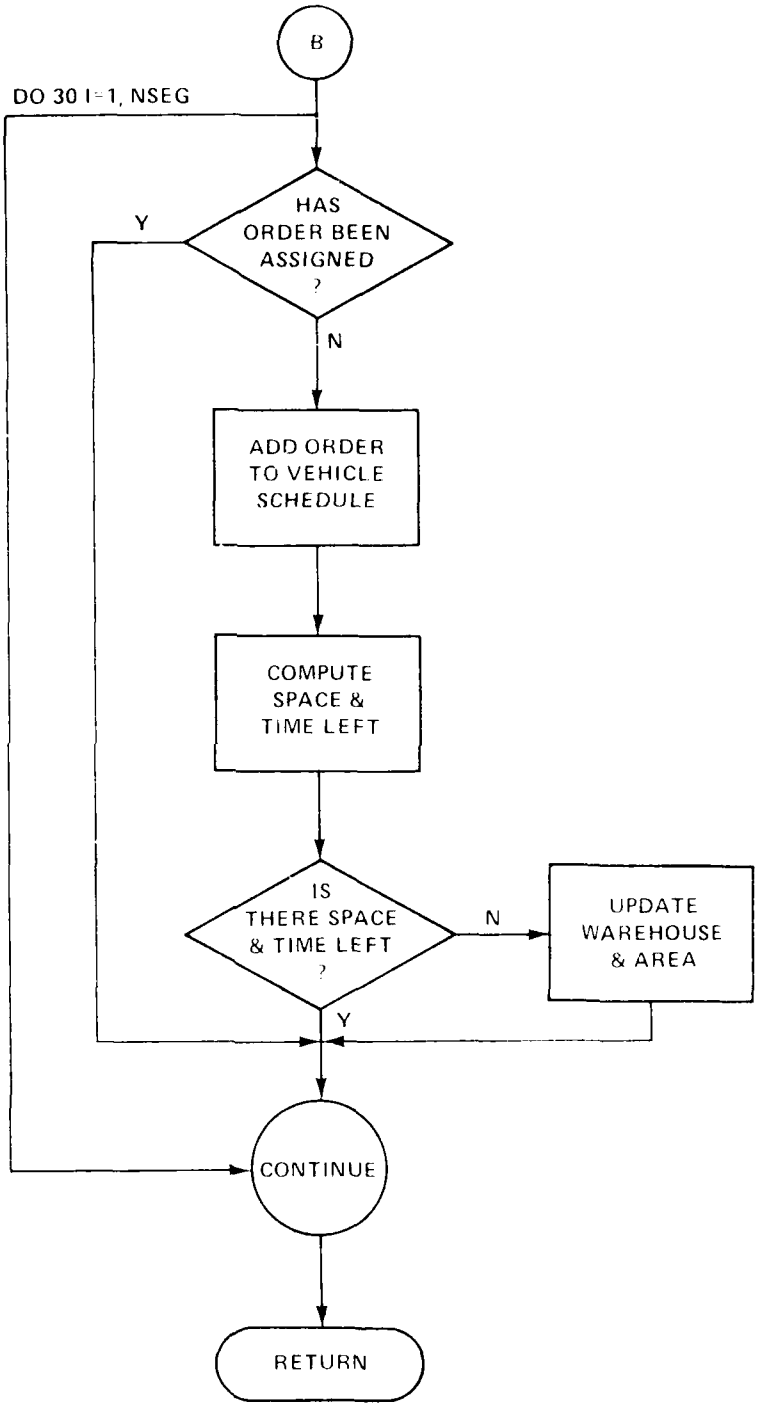
LSTORD - List number of last order added to route segment

Description:

BUILDS builds schedule segments considering space available on the vehicle and the sequence of order delivery for specified origin and destination areas. Selected orders are set negative and linked to the vehicle list. IFILL is incremented and IRCAP is reduced by the size of the order loaded. BUILDS assigns orders to a vehicle in a "first on, first off" manner.


ENTER BUILDS
DETERMINE PRESENT WAREHOUSE
DETERMINE ORIGIN & DESTINATION AREAS
DO 101 I=1 NORDR
IS ORDER ASSIGNED
Y
N
SAVE ORDER # IN SEG ARRAY NSEG=NSEG1
CONTINUE
ARE THERE ANY ORDERS TO BE CONSIDERED
N
RETURN
Y
A


A
DO 20 I=1, NSEG
DETERMINE ORIG & DEST & SIZE OF ORDER
IS ORIG PRESENT WAREHOUSE ?
N
Y
ADD ORDER TO VEHICLE SCHEDULE
COMPUTE REMAINING TIME & SPACE AVAILABLE
IS SPACE OR TIME ELAPSED ?
Y
UPDATE WAREHOUSE & AREA DATA
RETURN
CONTINUE
B


B
DO 30 I=1, NSEG
HAS ORDER BEEN ASSIGNED ?
Y
N
ADD ORDER TO VEHICLE SCHEDULE
COMPUTE SPACE & TIME LEFT
IS THERE SPACE & TIME LEFT ?
N
UPDATE WAREHOUSE & AREA
Y
CONTINUE
RETURN

```
      SUBROUTINE BUILDS(IFILL,IRCAP,LSTORD,NDELC)                       BUILDS     2
C*****************************************************************     BUILDS     3
C     THIS SUBROUTINE BUILDS SCHEDULES SEGMENTS BY USING              BUILDS     4
C     THE STRADDLE TRUCK ORDER OF LOAD / UNLOAD                       BUILDS     5
C     ------------ FIRST ON  -  FIRST OFF ---------------------       BUILDS     6
C                                                                     BUILDS     7
C     ITRUCK - CURRENT VEHICLE NO                                     BUILDS     8
C     ITYPE - VEHICLE TYPE                                            BUILDS     9
C     LASTW - LAST WHOUSE VISITED                                     BUILDS    10
C     LASTA - LAST AREA VISITED                                       BUILDS    11
C     NEXTA - NEXT AREA TO BE VISITED                                 BUILDS    12
C*****************************************************************     BUILDS    13
C                                                                     BUILDS    14
      INTEGER SORDR(20),CAPAC,PTSOR                                   BUILDS    15
     * ,TRUCK,PTTRK,ONUMB                                             BUILDS    16
      INTEGER SPLTSM(3)                                               BUILDS    17
      ALPHA WHNAM                                                     B1212      2
      REAL LTIME                                                      BUILDS    19
      COMMON                                                          BUILDS    20
     */GEN/ RTTIM,MINLD(4)                                            BUILDS    21
     */SCHEDLE/ ONUMB(200),INFO(200),IDESTP(200),IAREA(200),LB240(200),BUILDS    22
     *LBKWD(200),LCFW)(200),LGB40(200),ATIME(200),STOPT(200)          BUILDS    23
     */TRUCKS/ PTSOR(50),TRUC((50),CAPAC(50),STIME(50),LTIME(51),     BUILDS    24
     *RTLIM(50),TLEFT(50),NT                                          BUILDS    25
     */MSGENS/ NORDR,NTRKS(4),PTTRK(4)                                BUILDS    26
     */BLDS/ LASTW,LASTA,NEXTA,ITRUCK,ITYPE,IPASS,NPALTS,TIME         BUILDS    27
     */SPLIT/ NSPLIT                                                  BUILDS    28
     */SPCKD/ ICNTRL,SAVTIM,ISDRD                                     BUILDS    29
     */WHOUSE/ WHNAM(92)                                              BUILDS    30
      NPALTS=0                                                        BUILDS    31
      LSTORD=0                                                        BUILDS    32
      NSPLIT=NSPLIT                                                   BUILDS    33
      ISTART=1                                                        BUILDS    34
      IEND=NORDR                                                      BUILDS    35
C     NSEG - NO ORDERS ON SCHEDULE SEGMENT                            BUILDS    36
C     SORDR - SAVE ORDERS OF SEGMENT                                  BUILDS    37
   26 NSEG=0                                                          BUILDS    38
      JAREA= LASTA*100+NEXTA                                          BUILDS    39
      DO 100 I=ISTART,IEND                                            BUILDS    40
      IF(IPASS.GT.2) GO TO 35                                         BUILDS    41
      IF(ONUMB(I).GE.0) GO TO 110                                     BUILDS    42
      IF(ONUMB(I).GT.(-100)) GO TO 100                                BUILDS    43
   35 IF(INFO(I).LE.0) GO TO 100                                      BUILDS    44
      IF(JAREA.NE.IAREA(I)) GO TO 100                                 BUILDS    45
      IO=INFO(I)/10000                                                BUILDS    46
      IT=MOD(INFO(I)/100,100)                                         BUILDS    47
      IF(NOW(ITYPE,WHNAM(IO),WHNAM(IT)).EQ.1) GO TO 100               BUILDS    48
      NSEG=NSEG+1                                                     BUILDS    49
      SORDR(NSEG)= I                                                  BUILDS    50
  100 CONTINUE                                                        BUILDS    51
      IF(NSEG.LE.0) RETURN                                            BUILDS    52
C     SORT BY DESTINATION WAREHOUSE                                   BUILDS    53
C     SUM PALLETS TO BE DELIVERED                                     BUILDS    54
      IF(NSEG.GT.1) GO TO 101                                         BUILDS    55
      IORD=SORDR(1)                                                   BUILDS    56
      IF(MOD(INFO(IORD),100).GE.MINLD(ITYPE)) GO TO 186               BUILDS    57
      NDELC=0                                                         BUILDS    58
```

```
      SUBROUTINE BUILDS      74/74   OPT=0 ROUND=*/ TRACE          FTN 4.6+461        12/12/80  08.07.55

                  IF(IPASS.GT.2) NDELC=MOD(INFO(IORD),100)                                  BUILDS     59
                  RETURN                                                                    BUILDS     60
   60          101 LIMIT=NSEG-1                                                             BUILDS     61
                  NDELC=0                                                                   BUILDS     62
                  DO 45 I=1,LIMIT                                                           BUILDS     63
                  ISTART=I+1                                                                BUILDS     64
                  DO 40 J=ISTART,NSEG                                                       BUILDS     65
   65             IORD=SORDR(I)                                                             BUILDS     66
                  JORD=SORDR(J)                                                             BUILDS     67
                  IF(MOD(INFO(IORD)/100,100).LE.MOD(INFO(JORD)/100,100)) GO TO 40           BUILDS     68
                  SORDR(J)=SORDR(I)                                                         BUILDS     69
                  SORDR(I)=JORD                                                             BUILDS     70
   70          40 CONTINUE                                                                  BUILDS     71
               45 CONTINUE                                                                  BUILDS     72
                  IF(ICNTRL.EQ.0) GO TO 51                                                  BUILDS     73
                  ISUM=0                                                                    BUILDS     74
                  ISTART=0                                                                  BUILDS     75
   75             DO 80 I=1,LIMIT                                                           BUILDS     76
                  IORD=SORDR(I)                                                             BUILDS     77
                  JORD=SORDR(I+1)                                                           BUILDS     78
                  IF(ISTART.EQ.0) ISTART=I                                                  BUILDS     79
                  ILAST=I                                                                   BUILDS     80
   80             ISUM=ISUM+MOD(INFO(IORD),100)                                             BUILDS     81
                  IF(MOD(INFO(IORD)/100,100).EQ.MOD(INFO(JORD)/100 ,100)) GO TO 55          BUILDS     82
                  IF(I.NE.LIMIT) GO TO 65                                                   BUILDS     83
                  IF(MOD(INFO(JORD),100).GE.3) GO TO 65                                     BUILDS     84
                  SORDR(NSEG)=0                                                             BUILDS     85
   85             NDELC=NDELC+MOD(INFO(JORD),100)                                           BUILDS     86
               65 IF(ISUM.GE.3) GO TO 70                                                    BUILDS     87
                  DO 75 K=ISTART,ILAST                                                      BUILDS     88
               75 SORDR(K)=0                                                                BUILDS     89
                  NDELC=NDELC+ISUM                                                          BUILDS     90
   90          70 ISUM=0                                                                    BUILDS     91
                  ISTART=0                                                                  BUILDS     92
                  ILAST=0                                                                   BUILDS     93
                  GO TO 50                                                                  BUILDS     94
               55 IF(I.NE.LIMIT) GO TO 50                                                   BUILDS     95
   95             ISUM=ISUM+MOD(INFO(JORD),100)                                             BUILDS     96
                  IF(ISUM.GE.3) GO TO 50                                                    BUILDS     97
                  DO 60 K=ISTART,NSEG                                                       BUILDS     98
               60 SORDR(K)=0                                                                BUILDS     99
                  NDELC=NDELC+ISUM                                                          BUILDS    100
  100          50 CONTINUE                                                                  BUILDS    101
               51 DO 80 I=1,NSEG                                                            BUILDS    102
                  IF(SORDR(I).LE.0) GO TO 90                                                BUILDS    103
                  NDELC=0                                                                   BUILDS    104
               80 CONTINUE                                                                  BUILDS    105
  105             IF(IPASS.LE.2) NDELC=0                                                    BUILDS    106
            C     CONSIDER FIRST ORDERS WHERE ORIGIN =LASTW                                 BUILDS    107
                  ITSAVE=0                                                                  BUILDS    108
                  NSEG=NSEG                                                                 BUILDS    109
                  DO 150 I=1,NSEG                                                           BUILDS    110
  110             IF(SORDR(I).EQ.0) GO TO 150                                               BUILDS    111
                  IORD=SORDR(I)                                                             BUILDS    112
                  IT=MOD(INFO(IORD)/100,100)                                                BUILDS    113
                  IF(ITSAVE.EQ.0) GO TO 151                                                 BUILDS    114
                  IF(ITSAVE.EQ.IT) GO TO 150                                                BUILDS    115
```

```
      SUBROUTINE BUILDS      74/74   OPT=0 ROUND=*/ TRACE          FTN 4.6+467      12/12/80  08.07.55

                        MSEG=I-1                                                    BUILDS    115
                        GO TO 145                                                   BUILDS    117
                 140    DO 175 II=1,NORDR                                           BUILDS    118
                        IF(IORD.EQ.II) GO TO 175                                    BUILDS    119
                        IF(IT.NE.INFO(II)/10000) GO TO 175                          BUILDS    120
                        IF(MOD(IAREA(II),100).NE.NEXTA) GO TO 175                   BUILDS    121
                        IF(MOD(IPASS,2).EQ.0) IPASS=IPASS-1                         BUILDS    122
                        ITSAVE=IT                                                   BUILDS    123
                        GO TO 150                                                   BUILDS    124
                 175    CONTINUE                                                    BUILDS    125
                 150    CONTINUE                                                    BUILDS    126
                 185    NSEG=MSEG                                                   BUILDS    127
                 180    CONTINUE                                                    BUILDS    128
                        JSAV=0                                                      BUILDS    129
                        NWARE=0                                                     BUILDS    130
                        IF(NSEG.EQ.1) GO TO 950                                     BUILDS    131
                        MSEG=NSEG-1                                                 BUILDS    132
                        DO 800 I=1,MSEG                                             BUILDS    133
                        IF(SORDR(I).LE.0) GO TO 800                                 BUILDS    134
                        IORD=SORDR(I)                                               BUILDS    135
                        ISTART=I+1                                                  BUILDS    136
                        DO 800 J=ISTART,NSEG                                        BUILDS    137
                        IF(SORDR(J).LE.0) GO TO 800                                 BUILDS    138
                        JORD=SORDR(J)                                               BUILDS    139
                        IF(MOD(INFO(IORD),100).NE.MOD(INFO(JORD),100)) GO TO 800    BUILDS    140
                        SORDR(I)=JORD                                               BUILDS    141
                        SORDR(J)=IORD                                               BUILDS    142
                        IORD=JORD                                                   BUILDS    143
                 800    CONTINUE                                                    BUILDS    144
                 900    CONTINUE                                                    BUILDS    145
                 950    DO 1000 I=1,3                                               BUILDS    146
                1000    SPLTSM(I)=0                                                 BUILDS    147
                        DO 1100 I=1,NSEG                                            BUILDS    148
                        IF(SORDR(I).LE.0) GO TO 1100                                BUILDS    149
                         IORDR=SORDR(I)                                             BUILDS    150
                        ISIZE=MOD(INFO(IORDR),100)                                  BUILDS    151
                        IF(ISIZE.EQ.IRCAP) SPLTSM(1)=SPLTSM(1)+ISIZE                BUILDS    152
                        IF(ISIZE.LT.IRCAP) SPLTSM(2)=SPLTSM(2)+ISIZE                BUILDS    153
                        SPLTSM(3)=SPLTSM(3)+ISIZE                                   BUILDS    154
                1100    CONTINUE                                                    BUILDS    155
                        SPLTSM(2)=SPLTSM(1)+SPLTSM(2)                               BUILDS    156
                        NOFST=0                                                     BUILDS    157
                        DO 2000 ISPLIT=1,4SPLIT                                     BUILDS    158
                        IF(SPLTSM(ISPLIT).LT.MIN_)(ITYPE)) GO TO 2000               BUILDS    159
                        DO 200 I=1,NSEG                                             BUILDS    160
                        IF(SORDR(I).EQ.0) GO TO 200                                 BUILDS    161
                        IORDR=SORDR(I)                                              BUILDS    162
                        IF(INFO(IORDR)/10000.NE.LASTW) GO TO 200                    BUILDS    163
                C       ENOUGH PALLETS                                              BUILDS    164
                        IF(NEXTA.NE.LASTA) GO TO 187                                BUILDS    165
                        IF(NWARE.EQ.0) NWARE=MOD(INFO(IORDR)/100,100)               BUILDS    166
                        IF(MOD(INFO(IORDR)/100,100).NE.NWARE) GO TO 200             BUILDS    167
                 187    IPLTS=MOD(INFO(IORDR),100)                                  BUILDS    168
                        GO TO (2001,2002,2003),ISPLIT                               BUILDS    169
                2001    IF(IPLTS.EQ.IRCAP) GO TO 300                                BUILDS    170
                        GO TO 200                                                   BUILDS    171
                2002    IF(IPLTS.GT.IRCAP) GO TO 20                                 BUILDS    172
```

```
                GO TO 300                                                       AUTLOS   173
             2003 IF(IPLTS.LE.IRCAP) GO TO 305                                  AUTLOS   174
                IF(NEXTA.NE.LASTA) GO TO 305                                    AUTLOS   175
175             IF(NDEST.EQ.0) NDEST =MOD(INFO(IORDR)/100,100)                  AUTLOS   176
                 IF(NDEST.NE.MOD(INFO(IORDR)/100,100)) GO TO 200                AUTLOS   177
              305 ISAVE=IPLTS-IRCAP                                             AUTLOS   178
C               FORM NEW INFO/ORDER ELEMENT                                     AUTLOS   179
                INFO(IORDR)=INFO(IORDR)/100*100+ISAVE                           AUTLOS   180
180             NORDR=NORDR+1                                                   AUTLOS   181
                INFO(NORDR)=-(INFO(IORDR)/100*100+IRCAP)                        AUTLOS   182
                ONUMB(IORDR)=-IABS(ONUMB(IORDR))                                AUTLOS   183
                IAREA(NORDR)=IAREA(IORDR)                                       AUTLOS   184
                ONUMB(NORDR)=ONUMB(IORDR)                                       AUTLOS   185
185             NPALTS=NPALTS+IRCAP                                             AUTLOS   186
C                COMPUTE THE TIME REMAINING FOR VEHICLE                         AUTLOS   187
                TLEFT(ITRUCK)=TLEFT(ITRUCK)-(TIME+2.*(LTIME(ITRUCK)*FLOAT(IRCAP)  AUTLOS   188
               1+ STIME(ITRUCK)))                                               AUTLOS   189
                IRCAP=0                                                         AUTLOS   190
190             C       LINK SEGMENT TO SCHEDULE                                AUTLOS   191
                LSTORD=NORDR                                                    AUTLOS   192
                IF(PTSOR(ITRUCK).LE.0) PTSOR(ITRUCK)=NORDR                      AUTLOS   193
                LSTART=PTSOR(ITRUCK)                                            AUTLOS   194
                ISAVE=LSTART                                                    AUTLOS   195
195             LINK=LFRWD(LSTART)                                              AUTLOS   196
              325 IF(LINK.LE.0) GO TO 350                                       AUTLOS   197
                ISAVE=LINK                                                      AUTLOS   198
                LINK=LFRWD(LINK)                                                AUTLOS   199
                GO TO 325                                                       AUTLOS   200
200           350 IF(ISAVE.EQ.NORDR) GO TO 360                                  AUTLOS   201
                LFRWD(ISAVE)=NORDR                                              AUTLOS   202
                LBKWD(NORDR)=ISAVE                                              AUTLOS   203
              360 IFILL=IFILL+1                                                 AUTLOS   204
                IDESTP(NORDR)=IFILL                                             AUTLOS   205
205             IF(IFILL.EQ.1) GO TO 370                                        AUTLOS   206
                TLEFT(ITRUCK)=TLEFT(ITRUCK)+TIME                                AUTLOS   207
              370 IDEST=MOD(IABS(INFO(NORDR))/100,100)                          AUTLOS   208
                IF(JSAVE.EQ.0) JSAVE=IDEST                                      AUTLOS   209
                IF(JSAVE.NE.IDEST) TLEFT(ITRUCK)=TLEFT(ITRUCK)-2.               AUTLOS   210
210             LASTA=NEXTA                                                     AUTLOS   211
                LASTN=IDEST                                                     AUTLOS   212
                RETURN                                                          AUTLOS   213
              300 IF(NEXTA.NE.LASTA) GO TO 375                                  AUTLOS   214
                IF(NDEST.EQ.0) NDEST=MOD(INFO(IORDR)/100,100)                   AUTLOS   215
215             IF(NDEST.NE.MOD(INFO(IORDR)/100,100)) GO TO 200                 AUTLOS   216
              375 IFILL=IFILL+1                                                 AUTLOS   217
                NPALTS=NPALTS+IPLTS                                             AUTLOS   218
                IRCAP=IRCAP-IPLTS                                               AUTLOS   219
                IDEST=MOD(INFO(IORDR)/100,100)                                  AUTLOS   220
220           C       COMPUTE TIME REMAINING FOR VEHICLE                        AUTLOS   221
                TLEFT(ITRUCK)=TLEFT(ITRUCK)-(TIME+2.*(STIME(ITRUCK)+LTIME(ITRUCK)  AUTLOS   222
               1 *FLOAT(IPLTS)))                                                AUTLOS   223
                IF(JSAVE.EQ.0) JSAVE=IDEST                                      AUTLOS   224
                IF(JSAVE.NE.IDEST) TLEFT(ITRUCK)=TLEFT(ITRUCK)-2.               AUTLOS   225
225             JSAVE=IDEST                                                     AUTLOS   226
                IF(IFILL.EQ.1) GO TO 380                                        AUTLOS   227
                TLEFT(ITRUCK)=TLEFT(ITRUCK)+TIME                                AUTLOS   228
C               LINK SEGMENT TO SCHEDULE                                        AUTLOS   229
```

```
    SUBROUTINE BUILDS     74/74   OPT=0 ROUND=*/ TRACE          FTN 4.6+461        12/12/80  08.07.55

          380 INFO(IORDR)=-INFO(IORDR)                                              BUILDS    230
230           IDESTP(IORDR)=IFILL                                                   BUILDS    231
              LSTORD=IORDR                                                          BUILDS    232
              IF(PTSOR(ITRUCK).LE.0) PTSOR(ITRUCK)=IORDR                            BUILDS    233
              LSTART=PTSOR(ITRUCK)                                                  BUILDS    234
              ISAVE=LSTART                                                          BUILDS    235
235           LINK=LFRWD(LSTART)                                                    BUILDS    236
          410 IF(LINK.LE.0) GO TO 400                                               BUILDS    237
              ISAVE=LINK                                                            BUILDS    238
              LINK=LFRWD(LINK)                                                      BUILDS    239
              GO TO 410                                                             BUILDS    240
240       400 IF(ISAVE.EQ.IORDR) GO TO 420                                          BUILDS    241
              LFRWD(ISAVE)=IORDR                                                    BUILDS    242
              LBKWD(IORDR)=ISAVE                                                    BUILDS    243
          420 IF(IRCAP.LE.0) GO TO 421                                              BUILDS    244
              IF(TLEFT(ITRUCK).LE.0.0) GO TO 421                                    BUILDS    245
245           GO TO 200                                                             BUILDS    246
          421 LASTA=NEXTA                                                           BUILDS    247
              LASTW=IDEST                                                           BUILDS    248
              RETURN                                                                BUILDS    249
          200 CONTINUE                                                              BUILDS    250
250       2000 CONTINUE                                                             BUILDS    251
              NWARE=0                                                               BUILDS    252
              NDEST=0                                                               BUILDS    253
              DO 5000 ISPLIT=1,MSPLIT                                               BUILDS    254
              IF(SPLTSM(ISPLIT).LT.MINLD(ITYPE)) GO TO 5000                         BUILDS    255
255           DO 500 I=1,NSEG                                                       BUILDS    256
              IORDR=SORDR(I)                                                        BUILDS    257
              IF(IORDR.EQ.0) GO TO 500                                              BUILDS    258
              IF(INFO(IORDR).LE.0) GO TO 500                                        BUILDS    259
C             ENOUGH PALLETS                                                        BUILDS    260
260           IF(NEXTA.NE.LASTA) GO TO 505                                          BUILDS    261
              IF(NWARE.EQ.0) NWARE=MOD(INFO(IORDR)/100,100)                         BUILDS    262
              IF(NWARE.NE.MOD(INFO(IORDR)/100,100)) GO TO 500                       BUILDS    263
          505 IPLTS=MOD(INFO(IORDR),100)                                            BUILDS    264
              GO TO (5001,5002,5003),ISPLIT                                         BUILDS    265
265       5001 IF(IPLTS.EQ.IRCAP) GO TO 600                                         BUILDS    266
              GO TO 500                                                             BUILDS    267
          5002 IF(IPLTS.GT.IRCAP) GO TO 500                                         BUILDS    268
              GO TO 600                                                             BUILDS    269
          5003 IF(IPLTS.LE.IRCAP) GO TO 600                                         BUILDS    270
270           IF(NEXTA.NE.LASTA) GO TO 605                                          BUILDS    271
              IF(NDEST.EQ.0) NDEST =MOD(INFO(IORDR)/100,100)                        BUILDS    272
               IF(NDEST.NE.MOD(INFO(IORDR)/100,100)) GO TO 500                      BUILDS    273
          605 ISAVE=IPLTS-IRCAP                                                     BUILDS    274
C             FORM NEW INFO/ORDER ELEMENTS                                          BUILDS    275
275           INFO(IORDR)=INFO(IORDR)/100*100+ISAVE                                 BUILDS    276
              NORDR=NORDR+1                                                         BUILDS    277
              INFO(NORDR)=-(INFO(IORDR)/100*100+IRCAP)                              BUILDS    278
              ONUMB(IORDR)=-IABS(ONUMB(IORDR))                                      BUILDS    279
              ONUMB(NORDR)=ONUMB(IORDR)                                             BUILDS    280
280           IAREA(NORDR)=IAREA(IORDR)                                             BUILDS    281
              NPALTS=NPALTS+IRCAP                                                   BUILDS    282
C              COMPUTE THE TIME REMAINING FOR VEHICLE                               BUILDS    283
              TLEFT(ITRUCK)=TLEFT(ITRUCK)-(TIME+2.*(LTIME(ITRUCK)*FLOAT(IRCAP)      BUILDS    284
             1+ STIME(ITRUCK)))                                                     BUILDS    285
285           IRCAP=0                                                               BUILDS    286
```

```
C       LINK SEGMENT TO SCHEDULE                                        AUTLOS  287
        LSTORD=NORDR                                                    AUTLOS  288
        IF(PTSOR(ITRUCK).LE.0) PTSOR(ITRUCK)=NORDR                      AUTLOS  289
        LSTART=PTSOR(ITRUCK)                                            AUTLOS  290
290     ISAVE=LSTART                                                    AUTLOS  291
        LINK=LFRWD(LSTART)                                              AUTLOS  292
  625   IF(LINK.LE.0) GO TO 650                                         AUTLOS  293
        ISAVE=LINK                                                      AUTLOS  294
        LINK=LFRWD(LINK)                                                AUTLOS  295
295     GO TO 625                                                       AUTLOS  296
  650   IF(ISAVE.EQ.NORDR) GO TO 660                                    AUTLOS  297
        LFRWD(ISAVE)=NORDR                                              AUTLOS  298
        LBKWD(NORDR)=ISAVE                                              AUTLOS  299
  660   IFILL=IFILL+1                                                   AUTLOS  300
300     IDESTP(NORDR)=IFILL                                             AUTLOS  301
        IF(IFILL.EQ.1) GO TO 671                                        AUTLOS  302
        TLEFT(ITRUCK)=TLEFT(ITRUCK)+TIME                                AUTLOS  303
  670   IDEST=MOD(IABS(INFO(NORDR))/100,100)                            AUTLOS  304
        IF(JSAVE.EQ.0) JSAVE=IDEST                                      AUTLOS  305
305     IF(JSAVE.NE.IDEST) TLEFT(ITRUCK)=TLEFT(ITRUCK)-2.               AUTLOS  306
        LASTA=NEXTA                                                     AUTLOS  307
        LASTW=IDEST                                                     AUTLOS  308
        RETURN                                                          AUTLOS  309
  680   IF(NEXTA.NE.LASTA) GO TO 675                                    AUTLOS  310
310     IF(NDEST.EQ.0) NDEST=MOD(INFO(IORDR)/100,100)                   AUTLOS  311
        IF(NDEST.NE.MOD(INFO(IORDR)/100,100)) GO TO 500                 AUTLOS  312
  675   IFILL=IFILL+1                                                   AUTLOS  313
        NPALTS=NPALTS+IPLTS                                             AUTLOS  314
        IRCAP=IRCAP-IPLTS                                               AUTLOS  315
315     IDEST=MOD(INFO(IORDR)/100,100)                                  AUTLOS  316
C       COMPUTE TIME REMAINING FOR VEHICLE                              AUTLOS  317
        TLEFT(ITRUCK)=TLEFT(ITRUCK)-(TIME+2.*(STIME(ITRUCK)+LTIME(ITRUCK)  AUTLOS  318
       1 *FLOAT(IPLTS)))                                                AUTLOS  319
        IF(JSAVE.EQ.0) JSAVE=IDEST                                      AUTLOS  320
320     IF(JSAVE.NE.IDEST) TLEFT(ITRUCK)=TLEFT(ITRUCK)-2.               AUTLOS  321
        JSAVE=IDEST                                                     AUTLOS  322
        IF(IFILL.EQ.1) GO TO 680                                        AUTLOS  323
        TLEFT(ITRUCK)=TLEFT(ITRUCK)+TIME                                AUTLOS  324
C       LINK SEGMENT TO SCHEDULE                                        AUTLOS  325
325     INFO(IORDR)=-INFO(IORDR)                                        AUTLOS  326
        IDESTP(IORDR)=IFILL                                             AUTLOS  327
        LSTORD=IORDR                                                    AUTLOS  328
        IF(PTSOR(ITRUCK).LE.0) PTSOR(ITRUCK)=IORDR                      AUTLOS  329
        LSTART=PTSOR(ITRUCK)                                            AUTLOS  330
330     ISAVE=LSTART                                                    AUTLOS  331
        LINK=LFRWD(LSTART)                                              AUTLOS  332
  710   IF(LINK.LE.0) GO TO 700                                         AUTLOS  333
        ISAVE=LINK                                                      AUTLOS  334
        LINK=LFRWD(LINK)                                                AUTLOS  335
335     GO TO 710                                                       AUTLOS  336
  700   IF(ISAVE.EQ.IORDR) GO TO 720                                    AUTLOS  337
        LFRWD(ISAVE)=IORDR                                              AUTLOS  338
        LBKWD(IORDR)=ISAVE                                              AUTLOS  339
  720   IF(IRCAP.LE.0) GO TO 721                                        AUTLOS  340
340     IF(TLEFT(ITRUCK).LE.0.0) GO TO 721                              AUTLOS  341
        GO TO 500                                                       AUTLOS  342
  721   LASTA=NEXTA                                                     AUTLOS  343
        LASTW=IDEST                                                     AUTLOS  344
        RETURN                                                          AUTLOS  345
345     500 CONTINUE                                                    AUTLOS  346
 5000   CONTINUE                                                        AUTLOS  347
        IF(NPALTS.LE.0) RETURN                                          AUTLOS  348
        LASTA=NEXTA                                                     AUTLOS  349
        LASTW=IDEST                                                     AUTLOS  350
350     RETURN                                                          AUTLOS  351
        END                                                             AUTLOS  352
```

ROUTINE: MATCH

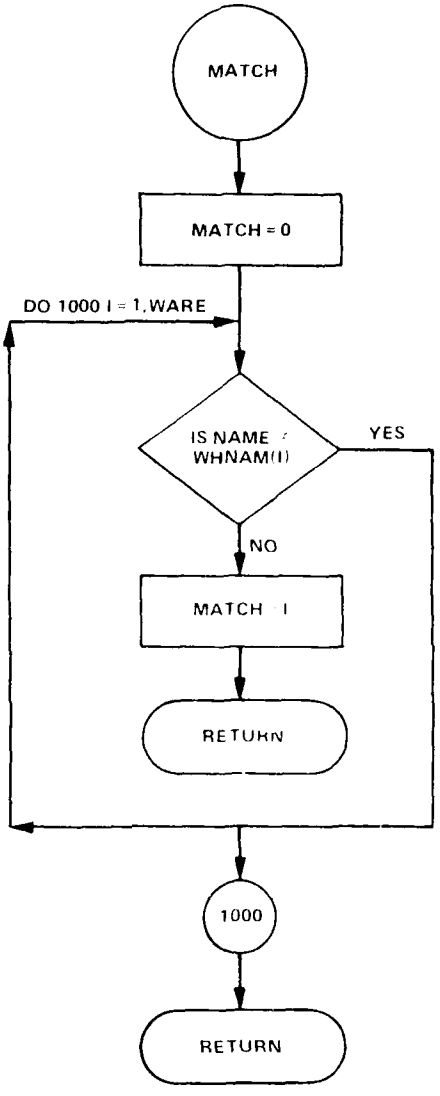
ARGUMENTS:

NAME - Alphanumeric warehouse name

IAREA - Area indicator of "NAME" warehouse

Description:

MATCH searches the warehouse name list for a match for NAME and returns its warehouse and area numbers.


MATCH
MATCH = 0
DO 1000 I = 1,WARE
IS NAME =
WHNAM(I)
YES
NO
MATCH = I
RETURN
1000
RETURN

```
FUNCTION NOW          74/74   OPT=0 ROUND=*/ TRACE          FTN 4.6+460        10/16/80  08.34.52

      1                 FUNCTION NOW(ITYPE,TO,IT)                                    AVS2   2
                        ALPHA IO,IT                                                  AVS2   3
                        NOW=0                                                        AVS2   4
                        GO TO (100,200,300,400),ITYPE                                AVS2   5
      5           100   IF(IO.EQ.3H193.OR.IT.EQ.3H193) GO TO 9999                    AVS2   6
                        IF(IO.EQ.4H1172.OR.IT.EQ.4H1172) GO TO 9999                  AVS2   7
                        IF(IO.EQ.4H1605.OR.IT.EQ.4H1605) GO TO  9999                 AVS2   8
                        RETURN                                                       AVS2   9
                  200   IF(IO.EQ.3H193.OR.IT.EQ.3H193) GO TO 9999                    AVS2  10
     10                 RETURN                                                       AVS2  11
                  300   RETURN                                                       AVS2  12
                  400   IF(IO.EQ.4H1172.OR.IT.EQ.4H1172) GO TO 9999                  AVS2  13
                        RETURN                                                       AVS2  14
                 9999   NOW=1                                                        AVS2  15
     15                 RETURN                                                       AVS2  16
                        END                                                          AVS2  17


      1                   FUNCTION MATCH(NAME,IAREA)                                 MATCH  2
                    C                                                                MATCH  3
                    C      FUNCTION MATCH FINDS THE POSITION OF NAME IN THE ARRAY    MATCH  4
                    C      WHNAM                                                     MATCH  5
      5             C                                                                MATCH  6
                    C                                                                MATCH  7
                    C        *** COMMONS ***                                         MATCH  8
                          ALPHA WHNAM,NAME                                           MATCH  9
                          COMMON/WHINTG/ NWARE,NAREA(16)                             MATCH 10
     10                   COMMON/WHOUSE/ WHNAM(92)                                   MATCH 11
                    C                                                                MATCH 12
                           AREA=0                                                    MATCH 13
                          MATCH = 0                                                  MATCH 14
                          DO 1000 I = 1, NWARE                                       MATCH 15
     15                   IF(NAME.EQ.WHNAM(I)) GO TO 2000                            MATCH 16
                     1000 CONTINUE                                                   MATCH 17
                          RETURN                                                     MATCH 18
                     2000 MATCH=I                                                    MATCH 19
                          I=I                                                        MATCH 20
     20                   ICHK=0                                                     MATCH 21
                          DO 3000 J=1,16                                             MATCH 22
                          ICHK=ICHK+NAREA(J)                                         MATCH 23
                          IF(I.LE.ICHK) GO TO 4000                                   MATCH 24
                     3000 CONTINUE                                                   MATCH 25
     25                   RETURN                                                     MATCH 26
                     4000 IAREA=J                                                    MATCH 27
                          RETURN                                                     MATCH 28
                          END                                                        MATCH 29
```

ROUTINE: ROUTE

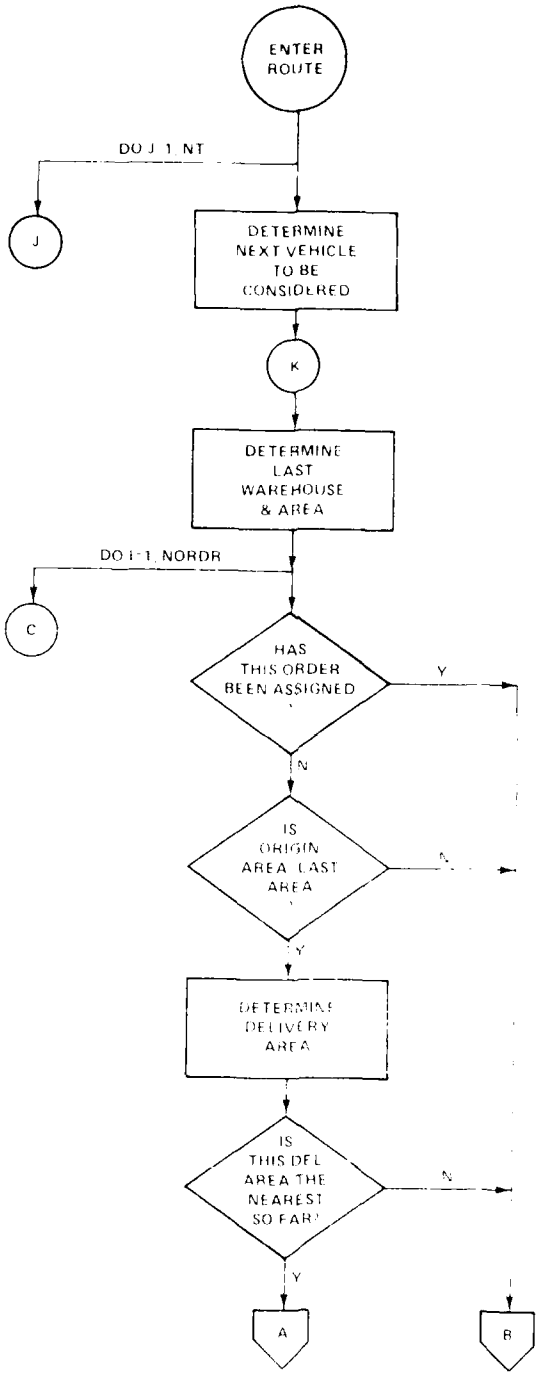
ARGUMENT: IAVS - Run option indicator

1, AVS1

2. AVS2

Description:

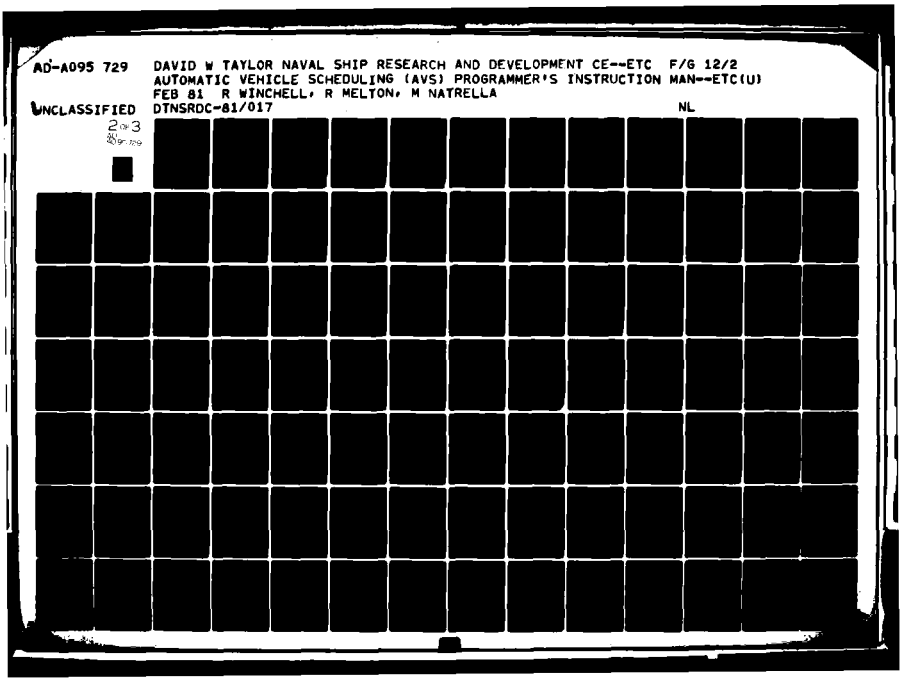
ROUTE applies the algorithm used in assigning orders to vehicles. It determines the next area of delivery for each available vehicle by searching the available orders, noting transfer and cargo movement times. The next area to be encountered by a vehicle is detemined by least travel time for which a minimum quantity of cargo is to be moved. Other restrictions, such as the accessibility of the area to the vehicle and the order of cargo delivery, are also imposed on the selection of the next area. Each area selected may be an order origin area, destination area, or both. Once origin and destination areas are known, ROUTE calls BLDTR (first on, last off) or BUILDS (first on, last off) to assign orders to the vehicle. The current area is updated and the next area selection process is repeated until the vehicle is out of time or the quantity of unassigned cargo does not meet delivery requirements.

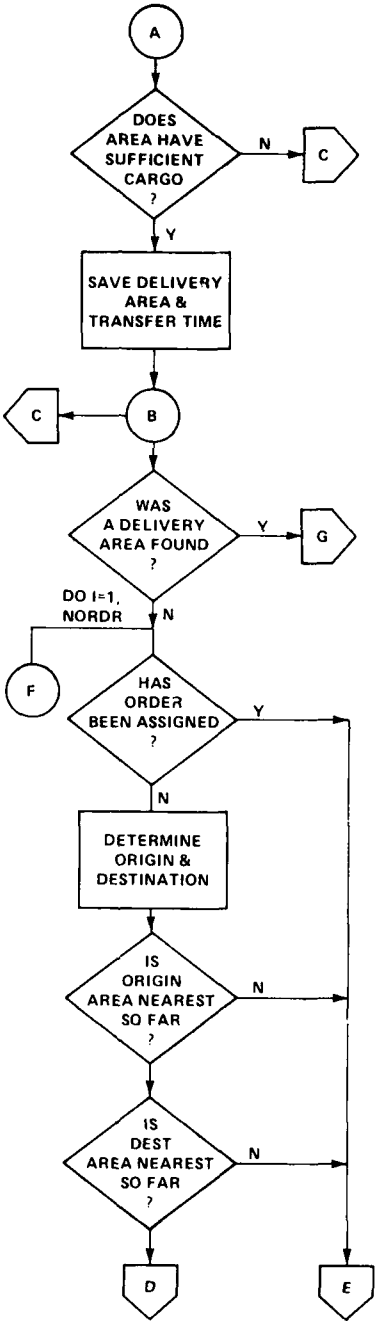

ENTER ROUTE
DO J 1 NT
J
DETERMINE NEXT VEHICLE TO BE CONSIDERED
K
DETERMINE LAST WAREHOUSE & AREA
DO I=1, NORDR
C
HAS THIS ORDER BEEN ASSIGNED
Y
N
IS ORIGIN AREA LAST AREA
Y
DETERMINE DELIVERY AREA
IS THIS DEL AREA THE NEAREST SO FAR?
N
Y
A
B

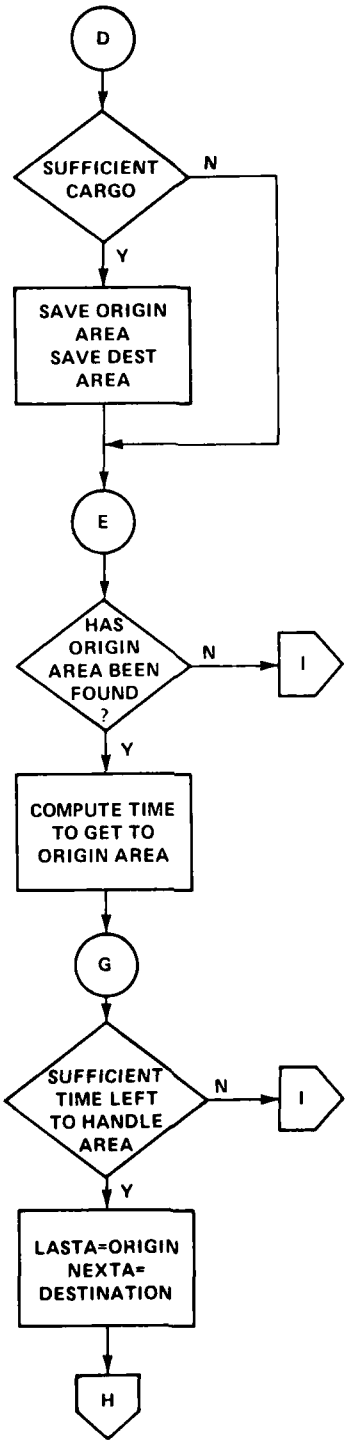
AD-A095 729 DAVID W TAYLOR NAVAL SHIP RESEARCH AND DEVELOPMENT CE--ETC F/G 12/2
AUTOMATIC VEHICLE SCHEDULING (AVS) PROGRAMMER'S INSTRUCTION MAN--ETC(U)
FEB 81 R WINCHELL, R MELTON, M NATRELLA

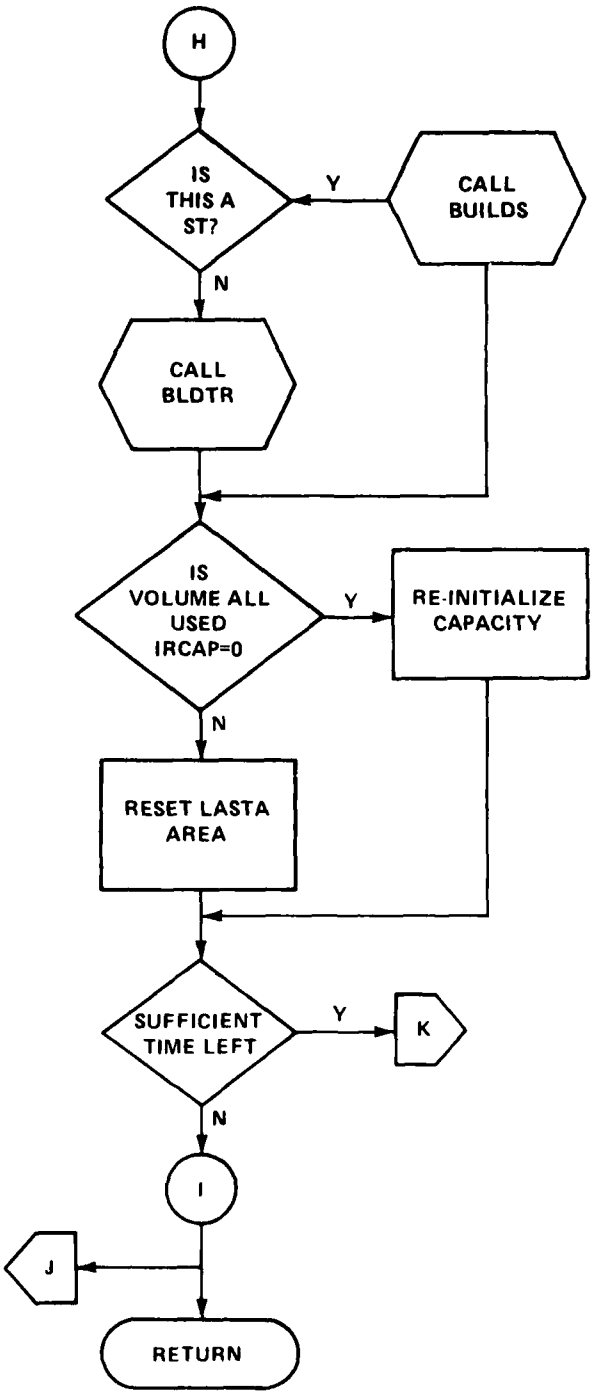
UNCLASSIFIED DTNSRDC-81/017 NL

2 OF 3
AD A095 729




A
DOES AREA HAVE SUFFICIENT CARGO ?
N
C
Y
SAVE DELIVERY AREA & TRANSFER TIME
C
B
WAS A DELIVERY AREA FOUND ?
Y
G
DO I=1, NORDR
N
F
HAS ORDER BEEN ASSIGNED ?
Y
N
DETERMINE ORIGIN & DESTINATION
IS ORIGIN AREA NEAREST SO FAR ?
N
IS DEST AREA NEAREST SO FAR ?
N
D
E


D
SUFFICIENT CARGO
N
Y
SAVE ORIGIN AREA
SAVE DEST AREA
E
HAS ORIGIN AREA BEEN FOUND ?
N
I
Y
COMPUTE TIME TO GET TO ORIGIN AREA
G
SUFFICIENT TIME LEFT TO HANDLE AREA
N
I
Y
LASTA=ORIGIN
NEXTA= DESTINATION
H


H
IS THIS A ST?
Y
CALL BUILDS
N
CALL BLDTR
IS VOLUME ALL USED IRCAP=0
Y
RE-INITIALIZE CAPACITY
N
RESET LASTA AREA
SUFFICIENT TIME LEFT
Y
K
N
I
J
RETURN

```
 SUBROUTINE ROUTE      74/74   OPT=0 ROUND=*/ TRACE          FTN 4.6+460        12/12/80  08.07.55

 1                SUBROUTINE ROUTE(IAVS)                                          ROUTE      2
                C*****************************************************************ROUTE      3
                C     ROUTE ASSIGNS ORDERS TO AVAILABLE VEHICLES                  ROUTE      4
                C     - COMMON AREA, ORIGIN AND DESTINATIONS                      ROUTE      5
 5              C     - NEAREST AREA TO LAST WAREHOUSE SERVICED                   ROUTE      6
                C*****************************************************************ROUTE      7
                      INTEGER LSTSV(16,16)                                        ROUTE      8
                      INTEGER PTTRK,ONUMB                                         ROUTE      9
                      INTEGER PTSOR,CAPAC,TRUCK,DATE                              ROUTE     10
 10                   INTEGER TYPORD(4)                                           ROUTE     11
                      ALPHA WHNAM                                                 11212      3
                      REAL LTIME                                                  ROUTE     13
                      COMMON                                                      ROUTE     14
                     */GEN/ RTTIM,MINLO(4)                                        ROUTE     15
 15                  */WHINTG/ NWARE,NAREA(16)                                    ROUTE     16
                     */SCHEDL/ ONUMB(200),INFO(200),IDESTP(200),IAREA(200),LFRWD(200),  ROUTE  17
                     *LBKWD(200),LCFWD(200),LCBWD(200),ATIME(200),STOPT(200)      ROUTE     18
                     */TRUCKS/ PTSOR(50),TRUCK(50),CAPAC(50),STIME(50),LTIME(50),ROUTE     19
                     * RTLIM(50),TLEFT(50),NT                                     ROUTE     20
 20                  */WHOUSE/ WHNAM(92)                                          ROUTE     21
                     */TIMTAB/ TTIME(3,45),TTIM2(6)                               ROUTE     22
                     */MSGLNS/ NORDR,NTRKS(4),PTTRK(4)                            ROUTE     23
                     */INOPT/ SHIFT,DATE                                          ROUTE     24
                     */BLOS/ LASTW,LASTA,NEXTA,ITRUCK,ITYPE,IPASS,NPALTS,TIME     ROUTE     25
 25                  */SPORD/ ICNTRL,SAVTIM,ISORD                                 ROUTE     26
                     */SPLIT/ NSPLIT                                              ROUTE     27
                     */LOADSV/ LOAD                                               ROUTE     28
                      DATA TYPORD/1,2,3,4/                                        ROUTE     29
                      IRESET=0                                                    ROUTE     30
 30             C                                                                ROUTE     31
                C      CONSIDER NEXT AVAILABLE VEHICLE                           ROUTE     32
                C     TYPE =1,STRADDLES                                          ROUTE     33
                C     TYPE =2, TRANSPORTERS                                      ROUTE     34
                C     TYPE =3, TRACTOR TRAILERS                                  ROUTE     35
 35             C      TYPE=4, INDUSTRIAL TRACTOR                                ROUTE     36
                C                                                                ROUTE     37
                C     TOTAL NUMBER OF PALLETS TO BE MOVED IN SHIFT               ROUTE     38
                C                                                                ROUTE     39
                      NSPLIT=1                                                    ROUTE     40
 40                   ISPASS=0                                                    ROUTE     41
                      IF(IAVS.EQ.1) ISPASS=2                                      ROUTE     42
                      LPA=2                                                       ROUTE     43
                      ISS=SHIFT                                                   ROUTE     44
                      KSHFT=(ISS/100)*60+MOD(ISS,100)                             ROUTE     45
 45                   ISS=SAVTIM                                                  ROUTE     46
                      TME=(ISS/100)*60+MOD(ISS,100)                               ROUTE     47
                      TME=TME-KSHFT                                               ROUTE     48
                      TME=RTTIM-TME                                               ROUTE     49
                      NOFF=0                                                      ROUTE     50
 50                   DO 25 I=1,NORDR                                             ROUTE     51
                      IF(INFO(I).LE.0) GO TO 25                                   ROUTE     52
                      IF(MOD(IAREA(I),100).GT.10) NOFF=NOFF+MOD(INFO(I),100)      ROUTE     53
                   25 CONTINUE                                                    ROUTE     54
                   50 ITYPE=0                                                     ROUTE     55
 55                   ICNT=0                                                      ROUTE     56
                  100 ICNT=ICNT+1                                                 ROUTE     57
                      IF(ICNT.GT.4) GO TO 9000                                    ROUTE     58
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   SUBROUTINE ROUTE      74/74   OPT=0 ROUND=*/ TRACE          FTN 4.6+461      12/12/80  08.07.55

                    ITYPE=TYPORD(ICNT)                                          ROUTE      59
                    IF(ITYPE.GT.2.AND.ICNTR..NE.0) GO TO 100                    ROUTE      60
   60               MTRKS=NTRKS(ITYPE)                                          ROUTE      61
                    IF(MTRKS.LE.0) GO TO 100                                    ROUTE      62
                    DO 80 JJ=1,16                                               ROUTE      63
                    DO 80 MM=1,16                                               ROUTE      64
                 80 LSTSV(JJ,MM)=0                                              ROUTE      65
   65               DO 200 L=1,MTRKS                                            ROUTE      66
                    ITRUCK=PTTRK(ITYPE)+L                                       ROUTE      67
                    LOCFF=0                                                     ROUTE      68
                    LOAD=0                                                      ROUTE      69
                    IFILL=0                                                     ROUTE      70
   70               IRCAP=CAPAC(ITRUCK)                                         ROUTE      71
                C   DETERMINE LAST WAREHOUSE OF VEHICLE                        ROUTE      72
                    LASTW=23                                                    ROUTE      73
                    LASTA=2                                                     ROUTE      74
                    IF(ICNTRL.NE.1) GO TO 180                                   ROUTE      75
   75               IF(NSPLIT.EQ.1) GO TO 150                                   ROUTE      76
                180 IF(PTSCR(ITRUCK).LE.0) GO TO 150                            ROUTE      77
                    LINK=PTSCR(ITRUCK)                                          ROUTE      78
                    LASTA=MOD(IAREA(LINK),100)                                  ROUTE      79
                    LASTW=MOD(IABS(INFO(LINK))/100,100)                         ROUTE      80
   80               185 LINKS=LFRWD(LINK)                                       ROUTE      81
                    IF(LINKS.LE.0) GO TO 155                                    ROUTE      82
                    IF(ITYPE.NE.1.AND.IDESTP(LINKS).GT.IDESTP(LINK)) GO TO 175  ROUTE      83
                    IF(ITYPE.EQ.1.AND.IDESTP(LINKS).LT.IDESTP(LINK)) GO TO 175  ROUTE      84
                     LASTA=MOD(IAREA(LINKS),100)                                ROUTE      85
   85                LASTW=MOD(IABS(INFO(LINKS))/100,100)                       ROUTE      86
                175 LINK=LINKS                                                  ROUTE      87
                    GO TO 185                                                   ROUTE      88
                155 IF(TLEFT(ITRUCK)-T(LASTA,LPA,ITYPE).LE.TME) GO TO 150       ROUTE      89
                    TLEFT(ITRUCK)=TME                                           ROUTE      90
   90               LASTA=2                                                     ROUTE      91
                    LASTW=23                                                    ROUTE      92
                C   DETERMINE NEAREST WAREHOUSE  WITH UNFILLED ORDER           ROUTE      93
                C   ORIGIN AREA = LASTA                                        ROUTE      94
                C   CHECK IF ANY ORDER  ORIGINATES IN LAST AREA                ROUTE      95
   95           C                                                               ROUTE      96
                C    IPASS = 1 BUILD NON-DEADEND ORDERS                         ROUTE      97
                C    IPASS = 2 BUILD DEADEND ORDERS                             ROUTE      98
                C                                                               ROUTE      99
                150 IPASS=ISPASS                                                ROUTE     100
  100               NOELG=0                                                     ROUTE     101
                    IF(LOAD.LE.0) GO TO 300                                     ROUTE     102
                311 DO 160 KK=1,16                                              ROUTE     103
                    DO 160 MM=1,16                                              ROUTE     104
                160 LSTSV(KK,MM)=0                                              ROUTE     105
  105           300 IPASS=IPASS+1                                               ROUTE     106
                312 IF(IPASS.GT.4) GO TO 200                                    ROUTE     107
                307 NEXTA=0                                                     ROUTE     108
                    TIME=1000.0                                                 ROUTE     109
                    ISTART=1                                                    ROUTE     110
  110               IEND=NORDR                                                  ROUTE     111
                C    SEARCH TO FIND NEAREST DESTINATION AREA TO LASTA           ROUTE     112
                302 DO 250 I=ISTART,IEND                                        ROUTE     113
                    IF(IPASS.GT.2) GO TO 303                                    ROUTE     114
                    IF(ONUMB(I).GE.0) GO TO 250                                 ROUTE     115
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   SUBROUTINE ROUTE      74/74   OPT=0 ROUND=*/ TRACE          FTN 4.6+461        12/17/80  18.07.55

115                IF(ONUMB(I).GT.(-100)) GO TO 250                                  ROUTE     115
                303 IF(LASTA.NE.IAREA(I)/100) GO TO 250                              ROUTE     117
                    NXT=MOD(IAREA(I),100)                                            ROUTE     118
                    IF(LSTSW(LASTA,NXT).NE.0) GO TO 250                              ROUTE     119
                    IF(INFO(I).LE.0) GO TO 251                                       ROUTE     120
120                 IO=INFO(I)/10000                                                 ROUTE     121
                    IT=MOD(INFO(I)/100,100)                                          ROUTE     122
                    IF(NOM(ITYPE,MMNAM(IO),4MNAM(IT)),EQ.1) GO TO 251                ROUTE     123
                    IDEST=MOD(IAREA(I),100)                                          ROUTE     124
                    IF(ITYPE.NE.3) GO TO 309                                         ROUTE     125
125                 IF(NOFF+LOOFF.LT.MIN(3)) GO TO 310                               ROUTE     126
                    IF(NOFF+LOOFF.LT.MIN(3)) GO TO 310                               ROUTE     127
                    IF(IDEST.LE.10) GO TO 251                                        ROUTE     128
                    GO TO 309                                                        ROUTE     129
                310 IF(IDEST.GT.10) GO TO 250                                        ROUTE     130
130             308 IF(IFILL.EQ.0) GO TO 306                                         ROUTE     131
                    IF(T(IDEST,NSAVE,ITYPE).GT.10.0) GO TO 250                       ROUTE     132
                304 CONTINUE                                                         ROUTE     133
                    TTEMP=T(LASTA,IDEST,ITYPE)                                       ROUTE     134
                    IF(MOD(IPASS,2).EQ.0) GO TO 251                                  ROUTE     135
135                 JSTART=1                                                         ROUTE     136
                    JEND=NORDR                                                       ROUTE     137
                    TTEMPS=1000.0                                                    ROUTE     138
                305 DO 220 II=JSTART,JEND                                            ROUTE     139
                    IF(IPASS.GT.2) GO TO 306                                         ROUTE     140
140                 IF(ONUMB(II).GE.0) GO TO 220                                     ROUTE     141
                    IF(ONUMB(II).GT.(-100)) GO TO 220                                ROUTE     142
                306 IF(INFO(II).LE.0) GO TO 220                                      ROUTE     143
                    IF(IAREA(II)/100.NE.IDEST) GO TO 220                             ROUTE     144
                    IO=INFO(II)/10000                                                ROUTE     145
145                 IT=MOD(INFO(II)/100,100)                                         ROUTE     146
                    IF(NOM(ITYPE,MMNAM(IO),4MNAM(IT)),EQ.1) GO TO 220                ROUTE     147
                    TTEMP1=T(IAREA(II)/100,10)(IAREA(II),100),ITYPE)                 ROUTE     148
                    IF(TTEMPS.GT.TTEMP1) TTEMPS=TTEMP1                               ROUTE     149
                220 CONTINUE                                                         ROUTE     150
150                  TTEMP=TTEMP+TTEMPS                                              ROUTE     151
                251 IF(TTEMP.GE.TIME) GO TO 250                                      ROUTE     152
                    NEXTA=IDEST                                                      ROUTE     153
                    TIME=TTEMP                                                       ROUTE     154
                250 CONTINUE                                                         ROUTE     155
155             C   TRANSFER TO BUILD NEXT SCHEDULE SEGMENT                          ROUTE     156
                    IF(NEXTA.LE.0) GO TO 210                                         ROUTE     157
                C                                                                    ROUTE     158
                C    DETERMINE PALLETS TO BE MOVED FROM LASTA TO NEXTA               ROUTE     159
                C                                                                    ROUTE     160
160                 ICHECK=LASTA*100+NEXTA                                           ROUTE     161
                    NSAME=0                                                          ROUTE     162
                    NPALTA=0                                                         ROUTE     163
                    DO 252 JJ=1,NORDR                                                ROUTE     164
                    IF(INFO(JJ).LE.0) GO TO 252                                      ROUTE     165
165                 IF(LASTA.NE.IAREA(JJ)/100) GO TO 252                             ROUTE     166
                    IO=INFO(JJ)/10000                                                ROUTE     167
                    IT=MOD(INFO(JJ)/100,100)                                         ROUTE     168
                    IF(NOM(ITYPE,MMNAM(IO),4MNAM(IT)),EQ.1) GO TO 252                ROUTE     169
                    IF(NSPLIT.EQ.1.AND.MOD(INFO(JJ),100).EQ.IRCAP) GO TO 255         ROUTE     170
170                 IF(NSPLIT.EQ.2.AND.MOD(INFO(JJ),100).LE.IRCAP) GO TO 255         ROUTE     171
                    IF(NSPLIT.EQ.3) GO TO 255                                        ROUTE     172
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                      GO TO 252                                                  ROUTE   173
                  255 IF(IAREA(JJJ).NE.ICHECK) GO TO 254                         ROUTE   174
                      NPALTA=NPALTA+MOD(INFO(JJJ),100)                           ROUTE   175
  175                 GO TO 252                                                  ROUTE   176
                  254 IF(T(LASTA,MOD(IAREA(JJJ),100),ITYPE).LE.10.0)             ROUTE   177
                     * NSAME=NSAME+MOD(INFO(JJJ),100)                           ROUTE   178
                  252 CONTINUE                                                   ROUTE   179
                      NPALTA=NPALTA+LOAD                                         ROUTE   180
  180                 IF(NDELC.NE.0) NPALTA=0                                    ROUTE   181
                      NDELC=0                                                    ROUTE   182
                      NSAME=NSAME+LOAD                                           ROUTE   183
                C                                                                ROUTE   184
                C     DETERMINE MIN LOAD FOR EACH TYPE                           ROUTE   185
  185                 NSAME=NSAME+NPALTA                                         ROUTE   186
                      GO TO (221,222,223,222),ITYPE                              ROUTE   187
                  221 IF(NPALTA.LT.MINLD(ITYPE)) GO TO 253                       ROUTE   188
                      GO TO 400                                                  ROUTE   189
                  222 IF(NPALTA.GE.MINLD(ITYPE)) GO TO 400                       ROUTE   190
  190                 IF(NSAME.LT.MINLD(ITYPE)) GO TO 253                        ROUTE   191
                      GO TO 400                                                  ROUTE   192
                  223 IF(NOFF+LOOFF.GE.MINLD(ITYPE)) GO TO 400                   ROUTE   193
                      IF(NSAME.GE.MINLD(ITYPE)) GO TO 400                        ROUTE   194
                      IF(NPALTA.GE.MINLD(ITYPE)) GO TO 400                       ROUTE   195
  195             C   TRY TO FIND NEXT AREA WITH MIN LOAD TO BE MOVED            ROUTE   196
                  253 LSTSV(LASTA,NEXTA)=LASTA                                   ROUTE   197
                      GO TO 307                                                  ROUTE   198
                C     DETERMINE NEAREST WAREHOUSE AREA TO LASTA                  ROUTE   199
                C      SEARCH AREAS TO FIND NEAREST AREA TO LASTA                ROUTE   200
  200             210 IF(ITYPE.NE.1) GO TO 212                                   ROUTE   201
                      IF(IFILL.EQ.0) GO TO 212                                   ROUTE   202
                      LASTA=NSAVE                                                ROUTE   203
                      GO TO 4050                                                 ROUTE   204
                  212 LSTA=0                                                     ROUTE   205
  205                 LSTW=0                                                     ROUTE   206
                      NEXTA=0                                                    ROUTE   207
                      TIMES=1000.0                                               ROUTE   208
                      DO 260 I=1,16                                              ROUTE   209
                      IF(I.EQ.LASTA) GO TO 260                                   ROUTE   210
  211                 ISTART=1                                                   ROUTE   211
                      IEND=NORDR                                                 ROUTE   212
                      TEMP1=T(LASTA,I,ITYPE)                                     ROUTE   213
                      TEMP2=1000.0                                               ROUTE   214
                      DO 265 II=ISTART,IEND                                      ROUTE   215
  215                 IF(IPASS.GT.2) GO TO 309                                   ROUTE   216
                      IF(ONUMR(II).GE.0) GO TO 265                               ROUTE   217
                      IF(ONUMR(II).GT.(-100)) GO TO 265                          ROUTE   218
                  309 IF(INFO(II).LE.0) GO TO 265                                ROUTE   219
                      IF(I.NE.IAREA(II)/100) GO TO 265                           ROUTE   220
  220                 ID=INFO(II)/10000                                          ROUTE   221
                      IT=MOD(INFO(II)/100,100)                                   ROUTE   222
                      IF(NOW(ITYPE,WHNAM(ID),WHNAM(IT)).EQ.1) GO TO 265          ROUTE   223
                      IDEST=MOD(IAREA(II),100)                                   ROUTE   224
                      IF(T(I,IDEST,ITYPE).GE.1000.0) GO TO 265                   ROUTE   225
  225                 IF(IFILL.EQ.0) GO TO 274                                   ROUTE   226
                      IF(T(IDEST,NSAVE,ITYPE).GT.10.0) GO TO 265                 ROUTE   227
                  274 IF(MOD(IPASS,2).EQ.0) GO TO 270                            ROUTE   228
                      DO 275 III=ISTART,IEND                                     ROUTE   229
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      SUBROUTINE ROUTE      74/74   OPT=1 ROUND=*/ TRACE          FTN 4.6+461        12/12/80  18.07.55

                  IF(INFO(III).LE.0) GO TO 275                                                ROUTE     231
230               IF(IPASS.GT.2) GO   TO 276                                                  ROUTE     231
                  IF(ONUMB(III).GE.3) GO TO 275                                               ROUTE     232
                276 IF(IDEST.NE.IAREA(III)/100) GO TO 275                                     ROUTE     233
                  GO TO 270                                                                   ROUTE     234
                275 CONTINUE                                                                  ROUTE     235
235               GO TO 260                                                                   ROUTE     236
                270 IF(TEMP2.LE.T(I,IDEST,ITYPE)) GO TO 265                                   ROUTE     237
                C     GOES NEXT AREA HAVE MIN LOAD FOR THIS TYPE                              ROUTE     238
                  IF(ITYPE.NE.3) GO TO 205                                                    ROUTE     239
                  IF(NOFF+LDOFF.LT.MINLD(3)) GO TO 205                                        ROUTE     240
240               IF(IDEST.LE.10) GO TO 255                                                   ROUTE     241
                  GO TO 206                                                                   ROUTE     242
                205 IF(IDEST.GT.10) GO TO 255                                                 ROUTE     243
                206 NSAVE=MOD(IAREA(II),100)                                                  ROUTE     244
                  IF(LSTSV(I,NSAVE).NE.0) GO TO 265                                           ROUTE     245
245               TEMP2=T(I,IDEST,ITYPE)                                                      ROUTE     246
                  LSAVEW=INFO(II)/10000                                                       ROUTE     247
                  NSAVEA=MOD(IAREA(II),100)                                                   ROUTE     248
                265 CONTINUE                                                                  ROUTE     249
                  TIME=TEMP1+TEMP2                                                            ROUTE     251
250               IF(TIME.GE.TIMES) GO TO 250                                                 ROUTE     251
                  TIMES=TIME                                                                  ROUTE     252
                  LSTW=LSAVEW                                                                 ROUTE     253
                  NEXTA=NSAVEA                                                                ROUTE     254
                  LSTA=I                                                                      ROUTE     255
255               260 CONTINUE                                                                ROUTE     256
                  IF(TIMES.GE.1000.0) GO TO 300                                               ROUTE     257
                  IF(LSTA.LE.0) GO TO 300                                                     ROUTE     258
                  NSAME=0                                                                     ROUTE     259
                  NPALTA=0                                                                    ROUTE     260
260               ICHECK=LSTA*100+NEXTA                                                       ROUTE     261
                  DO 261 JJ=1,NOROR                                                           ROUTE     262
                  IF(INFO(JJ).LE.0) GO TO 261                                                 ROUTE     263
                  IF(NSPLIT.EQ.1.AND.MOD(INFO(JJ),100).EQ.IRCAP) GO TO 263                    ROUTE     264
                  IF(NSPLIT.EQ.2.AND.MOD(INFO(JJ),100).LE.IRCAP) GO TO  263                   ROUTE     265
265               IF(NSPLIT.EQ.3) GO TO 263                                                   ROUTE     265
                  GO TO 261                                                                   ROUTE     267
                263 IF(LSTA.NE.IAREA(JJ)/100) GO TO 261                                       ROUTE     268
                  ID=INFO(JJ)/10000                                                           ROUTE     269
                  IT=MOD(INFO(JJ)/100,100)                                                    ROUTE     270
270               IF(NOW(ITYPE,WHNAM(ID),WHNAM(IT)).EQ.1) GO TO 261                           ROUTE     271
                  IF(ICHECK.NE.IAREA(JJ)) GO TO 264                                           ROUTE     272
                  NPALTA=NPALTA+MOD(INFO(JJ),100)                                             ROUTE     273
                  GO TO 261                                                                   ROUTE     274
                264 IF(T(LSTA,MOD(IAREA(JJ),100),ITYPE).LE.10.0)                              ROUTE     275
275               *  NSAME=NSAME+MOD(INFO(JJ),100)                                            ROUTE     276
                261 CONTINUE                                                                  ROUTE     277
                C     DETERMINE MIN LOAD FOR EACH TYPE                                        ROUTE     278
                  NSAME=NSAME+LOAD                                                            ROUTE     279
                  NPALTA=NPALTA+LOAD                                                          ROUTE     280
280               NSAME=NSAME+NPALTA                                                          ROUTE     281
                  GO TO (225,226,227,226),ITYPE                                               ROUTE     282
                225 IF(NPALTA.LT.MINLD(ITYPE)) GO TO 262                                      ROUTE     283
                  GO TO 280                                                                   ROUTE     284
                226 IF(NPALTA.GE.MINLD(ITYPE)) GO TO 280                                      ROUTE     285
285               IF(NSAME.LT.MINLD(ITYPE)) GO TO 262                                         ROUTE     285
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                    GO TO 280                                                    ROUTE   287
                227 IF(NOFF+LOOFF.GE.MINLO(ITYPE)) GO TO 280                     ROUTE   288
                    IF(NSAME.GE.MINLO(ITYPE)) GO TO 280                          ROUTE   289
                    IF(NPALTA.GE.MINLO(ITYPE)) GO TO 280                         ROUTE   290
290             C   TRY TO FIND NEXT AREA WITH MIN LOAD TO BE MOVED              ROUTE   291
                262 LSTSV(LSTA,NEXTA)=LSTA                                       ROUTE   292
                    GO TO 210                                                    ROUTE   293
                C   BUILD NEXT PORTION OF SCHEDULE BETWEEN AREAS                 ROUTE   294
                C   LASTA AND NEXTA - TRAVEL TIME = TIME                        ROUTE   295
295             C   CONSIDER ORDERS WITH SAME ORIGIN AND DESTINATION             ROUTE   296
                C   SAME DESTINATION - DIFFERENT ORIGINS                         ROUTE   297
                C   DIFFERENT ORIGINS AND DESTINATIONS                           ROUTE   298
                C   SELECT BEST SCHEDULE SEGMENT BY NO OF PALLETS / TIME         ROUTE   299
                C    ADD SEGMENT TO  CURRENT VEHICLE SCHEDULE                    ROUTE   300
300             C   UPDATE LAST AREA  ,LASTA, AND LAST WAREHOUSE VISITED,LASTW   ROUTE   301
                280 TIME=T(LASTA,LSTA,ITYPE)                                     ROUTE   302
                    IF(IFILL.NE.0.AND.LOAD.LT.MINLO(ITYPE)) GO TO 390            ROUTE   303
                    TIMES=TIME+T(LSTA,LPA,ITYPE)+STIME(ITRUCK)                   ROUTE   304
                    TIMES=TIMES+STIME(ITRUCK)+2.*LTIME(ITRUCK)*FLOAT(MINLO(ITYPE))  ROUTE   305
305                 IF((TLEFT(ITRUCK)-TIMES).LE.0.0) GO TO 200                   ROUTE   306
                    TIMES=TIME+STIME(ITRUCK)+T(NEXTA,LPA,ITYPE)                  ROUTE   307
                    IF(IFILL.NE.0.AND.NSAVE.EQ.NEXTA) GO TO 335                  ROUTE   308
                    IF((TLEFT(ITRUCK)-TIMES).LE.0.0) GO TO 200                   ROUTE   309
                390 TLEFT(ITRUCK)=TLEFT(ITRUCK)-TIME                             ROUTE   310
310                 395 LASTA=LSTA                                               ROUTE   311
                    LASTW=LSTW                                                   ROUTE   312
                400 TIME=T(LASTA,NEXTA,ITYPE)                                    ROUTE   313
                    LSAVE=LASTA                                                  ROUTE   314
                    NSAVE=NEXTA                                                  ROUTE   315
315                 GO TO (1000,2000,3000,3000) ,ITYPE                           ROUTE   316
                C   BUILD SCHEDULES FOR STRADDLES                               ROUTE   317
                1000 CALL BUILDS(IFILL,IRCAP,LSTORD,NDELC)                       ROUTE   318
                    IF(IRCAP.LE.0) GO TO 4050                                    ROUTE   319
                    GO TO 3001                                                   ROUTE   320
320             C   BUILD SCHEDULES FOR TRANSPORTERS                            ROUTE   321
                2000 CALL BLDTR(IFILL,IRCAP,LSTORD)                              ROUTE   322
                    IF(IRCAP.LE.0) GO TO 4050                                    ROUTE   323
                    GO TO 3001                                                   ROUTE   324
                C   BUILD SCHEDULES FOR TRACTOR TRAILERS                        ROUTE   325
325             3000 CALL BLDTR(IFILL,IRCAP,LSTORD)                              ROUTE   326
                    IF(LASTA.GT.10) NOFF=NOFF-NPALTS                             ROUTE   327
                    IF(IRCAP.LE.0) GO TO 4050                                    ROUTE   328
                3001 IF(NPALTS.LE.0) GO TO 4000                                  ROUTE   329
                    IF(MOD(IPASS,2).NE.0) GO TO 4050                             ROUTE   330
330                 DO 3002 II=1,NORDR                                           ROUTE   331
                    IF(INFC(II).LE.0) GO TO 3002                                 ROUTE   332
                    IF(IAREA(II)/100.GT.10) GO TO 3002                           ROUTE   333
                    IF(NSAVE.NE.IAREA(II)/100) GO TO 3002                        ROUTE   334
                    GO TO 4050                                                   ROUTE   335
335             3002 CONTINUE                                                    ROUTE   336
                    LOAD=LOAD+NPALTS                                             ROUTE   337
                    IF(NEXTA.GT.10) LOOFF=LOOFF+NPALTS                           ROUTE   338
                    IF(LSAVE.EQ.NSAVE) GO TO 4050                                ROUTE   339
                    LASTA=LSAVE                                                  ROUTE   341
340                 GO TO 4000                                                   ROUTE   341
                4050 JFILL=IABS(IFILL)                                           ROUTE   342
                    IF(ITYPE.EQ.1) GO TO 4050                                    ROUTE   343
```

```
   SUBROUTINE ROUTE      74/74   OPT=0 ROUND=*/ TRACE          FTN 4.6+461      12/12/80  08.07.55

                     IF(JFILL.LT.3) GO TO 4050                                  ROUTE     344
                     CALL SRTDST(LSTORD,ITYPE,JFILL)                            ROUTE     343
345          4060    IRCAP=CAPAC(ITRUCK)                                        ROUTE     345
                     IFILL=0                                                    ROUTE     347
                     LOAD=0                                                     ROUTE     348
                     LDOFF=0                                                    ROUTE     349
                     IF(TLEFT(ITRUCK).LE.0.0) GO TO 200                         ROUTE     350
350                  IF(NPALTS.GT.0) GO TO 150                                  ROUTE     351
                     LSTSV(LSAVE,NSAVE)=1                                       ROUTE     352
                     GO TO 150                                                  ROUTE     353
                4000 LASTA=LSAVE                                                ROUTE     354
                     NPALTL=NPALTL-NPALTS                                       ROUTE     355
355                  IF(NPALTS.LE.0) LSTSV(LSAVE,NSAVE)=1                       ROUTE     356
                     IF(TLEFT(ITRUCK).LE.0.0) GO TO 200                         ROUTE     357
                     IF(IPASS.LT.4) GO TO 30)                                   ROUTE     358
                     IF(LSTSV(LSAVE,NSAVE).EQ.)) GO TO 150                      ROUTE     359
                     IPASS=ISPASS                                               ROUTE     360
360                  GO TO 300                                                  ROUTE     361
                 200 CONTINUE                                                   ROUTE     362
                     GO TO 100                                                  ROUTE     363
                C    CHECK IF ORDERS CAN BE ADDED TO BEGINNING OF SCHEDULE      ROUTE     364
                9000 IF(ICNTRL.NE.1) GO TO 9005                                 ROUTE     365
365                  IF(NSPLIT.EQ.2) GO TO 9010                                 ROUTE     366
                9005 IF(NSPLIT.EQ.3) GO TO 9010                                 ROUTE     367
                     NSPLIT=NSPLIT+1                                            ROUTE     368
                     GO TO 50                                                   ROUTE     369
                9010 IF(IRESET.NE.0) RETURN                                     ROUTE     370
370                  IRESET=1                                                   ROUTE     371
                     ICNTRL=0                                                   ROUTE     372
                     ISPASS=0                                                   ROUTE     373
                     NSPLIT=1                                                   ROUTE     374
                     DO 9020 II=1,NORDR                                         ROUTE     375
375                  IF(INFO(II).LE.0) GO TO 9020                               ROUTE     376
                     GO TO 50                                                   ROUTE     377
                9020 CONTINUE                                                   ROUTE     378
                     RETURN                                                     ROUTE     379
                     END                                                        ROUTE     380
```

ROUTINE: SRTDST

ARGUMENTS:

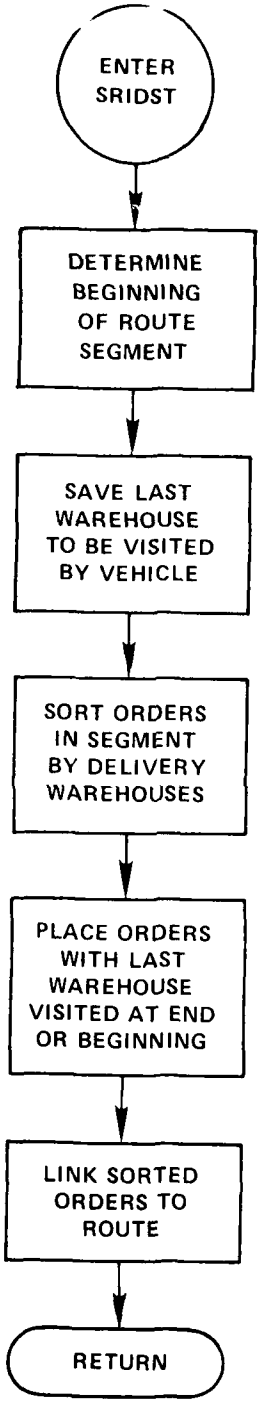
LSTORD - List number of last order added to route segment

ITYPE - Vehicle type number

JFILL - Number of orders in route segment

Description:

SRTDST re-orders the last route segment for a given vehicle. Order destinations are re-arranged to allow maximum vehicle utilization with a minimum travel time.


ENTER SRIDST
DETERMINE BEGINNING OF ROUTE SEGMENT
SAVE LAST WAREHOUSE TO BE VISITED BY VEHICLE
SORT ORDERS IN SEGMENT BY DELIVERY WAREHOUSES
PLACE ORDERS WITH LAST WAREHOUSE VISITED AT END OR BEGINNING
LINK SORTED ORDERS TO ROUTE
RETURN

```
SUBROUTINE SRTDST     73/74   OPT=0 ROUND=*/ TRACE          FTN 4.6+468      12/12/88  10.04.08

      1                 SUBROUTINE SRTDST(LSTORD,ITYPE,JFILL)                                  SRTD        2
                      C                                                                        SRTD        3
                      C                                                                        SRTD        4
                      C*************************************************************************SRTD        5
      5               C                                                                        SRTD        6
                      C     SRTDST SORTS ENTRIES IN A ROUTE SEGMENT BY DESTINATION             SRTD        7
                      C     WAREHOUSE AND GROUPS COMMON DESTINATIONS ON A                      SRTD        8
                      C     FIRST ON - LAST OFF BASIS                                          SRTD        9
                      C                                                                        SRTD       10
     10               C*************************************************************************SRTD       11
                      C                                                                        SRTD       12
                      C                                                                        SRTD       13
                      C      LSTORD - LAST LIST ENTRY OF ROUTE SEGMENT                         SRTD       14
                      C      ITYPE - VEHICLE TYPE                                              SRTD       15
     15               C      JFILL - NUMBER OF ORDERS IN ROUTE SEGMMENT                        SRTD       16
                      C                                                                        SRTD       17
                      C                                                                        SRTD       18
                            INTEGER ONUMB,WARE(14),PTR(14)                                     SRTD       19
                            COMMON                                                             SRTD       20
     20                    */SCHEDL/ ONUMB(200),INFO(200),IDESTP(200),IAREA(200),             SRTD       21
                           * LFRWD(200),LBKWD(200),IDUM(400),DUM(400)                          SRTD       22
                            DO 50 I=1,14                                                       SRTD       23
                            WARE(I)=0                                                          SRTD       24
                         50 PTR(I)=0                                                           SRTD       25
     25               C     FIND START OF SEGMENT                                             SRTD       26
                            ISTART=LSTORD                                                      SRTD       27
                            ICNT=0                                                             SRTD       28
                        100 WARE(JFILL-ICNT)=MOD(IABS(INFO(ISTART))/100,100)                   SRTD       29
                            PTR(JFILL-ICNT)=ISTART                                             SRTD       30
     30                     ICNT=ICNT+1                                                        SRTD       31
                            IF(JFILL.NE.ICNT) GO TO 200                                        SRTD       32
                            IFIRST=ISTART                                                      SRTD       33
                            GO TO 300                                                          SRTD       34
                        200 ISTART=LBKWD(ISTART)                                               SRTD       35
     35                     GO TO 100                                                          SRTD       36
                      C     GROUP LIKE DESTINATIONS                                           SRTD       37
                      C     SORT ORDER SEGMENT                                                SRTD       38
                        300 LIMIT=ICNT-1                                                       SRTD       39
                            I=1                                                                SRTD       40
     40                 350 JSTART=I+1                                                        SRTD       41
                            MCNT=0                                                             SRTD       42
                            DO 400 J=JSTART,ICNT                                               SRTD       43
                            IF(WARE(I).NE.WARE(J)) GO TO 400                                   SRTD       44
                            MCNT=MCNT+1                                                        SRTD       45
     45                     IF(J.EQ.JSTART) GO TO 400                                          SRTD       46
                            ISAVE=WARE(I+MCNT)                                                 SRTD       47
                            JSAVE=PTR(I+MCNT)                                                  SRTD       48
                            WARE(I+MCNT)=WARE(J)                                               SRTD       49
                            PTR(I+MCNT)=PTR(J)                                                 SRTD       50
     50                     WARE(J)=ISAVE                                                      SRTD       51
                            PTR(J)=JSAVE                                                       SRTD       52
                        400 CONTINUE                                                           SRTD       53
                            IF(MCNT.EQ.0) I=I+1                                                SRTD       54
                            I=I+MCNT                                                           SRTD       55
     55                     IF(I.LE.LIMIT) GO TO 350                                           SRTD       56
                      C      ADJUST LINKED LISTS POINTERS WITH DELIVERY SEQUENCE              SRTD       57
                            JCNT=ICNT-1                                                        SRTD       58
```

```
 SUBROUTINE SRTDST     73/74   OPT=? ROUND=*/ TRACE          FTN 4.6+468      12/12/80  18.04.08

                                                                                SRTD      59
                      DO 500 I=1,JCNT                                           SRTD      60
                      LINK=PTR(I)                                               SRTD      61
60                    LFRWD(LINK)=PTR(I+1)                                      SRTD      62
                      IF(I.GT.1) LBKWD(LINK)=PTR(I-1)                           SRTD      63
                      IDESTP(LINK)=-I                                           SRTD      64
                  500 CONTINUE                                                  SRTD      65
                      LINK=PTR(ICNT)                                            SRTD      66
65                    IDESTP(LINK)=-ICNT                                        SRTD      67
                      LFRWD(LINK)=0                                             SRTD      68
                      LBKWD(LINK)=PTR(ICNT-1)                                   SRTD      69
                      RETURN                                                    SRTD      70
                      END
```

ROUTINE: T

ARGUMENTS:

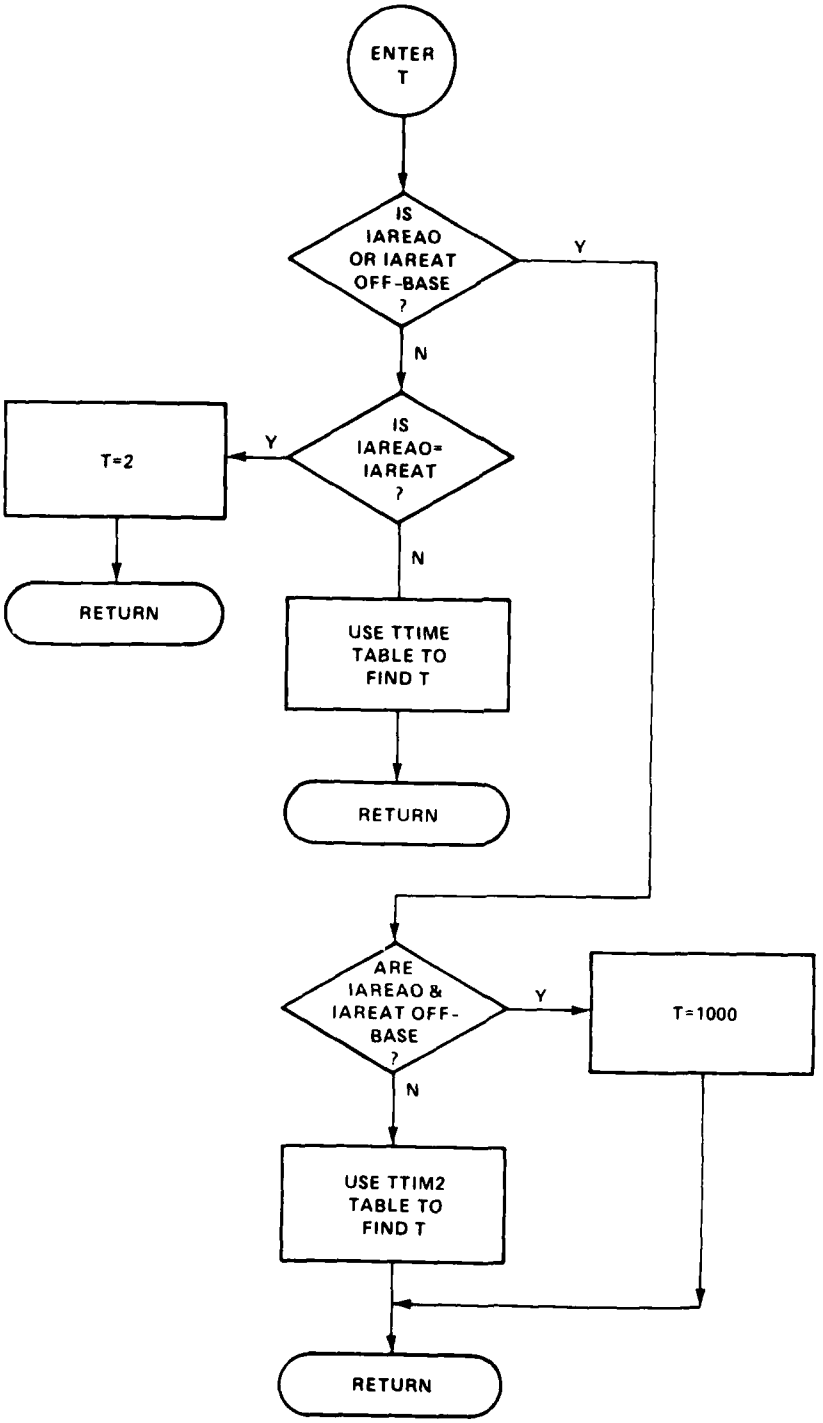
IAREAO - Origin area number

IAREAT - Destination area number

K - Vehicle type number

Description:

T computes the travel time between two areas, IAREAO and IAREAT, for a vehicle of type K. If IAREAO equals IAREAT, T is set equal to 2 minutes. If IAREAO and IAREAT are both off base sites, T is set equal to 1000 minutes to prevent travel between the two areas.


ENTER T
IS IAREAO OR IAREAT OFF-BASE ?
Y
N
IS IAREAO= IAREAT ?
Y
T=2
RETURN
N
USE TTIME TABLE TO FIND T
RETURN
ARE IAREAO & IAREAT OFF-BASE ?
Y
T=1000
N
USE TTIM2 TABLE TO FIND T
RETURN

```
     FUNCTION T          74/74   OPT=0 ROUND=*/ TRACE          FTN 4.6+468        10/17/80  10.04.17

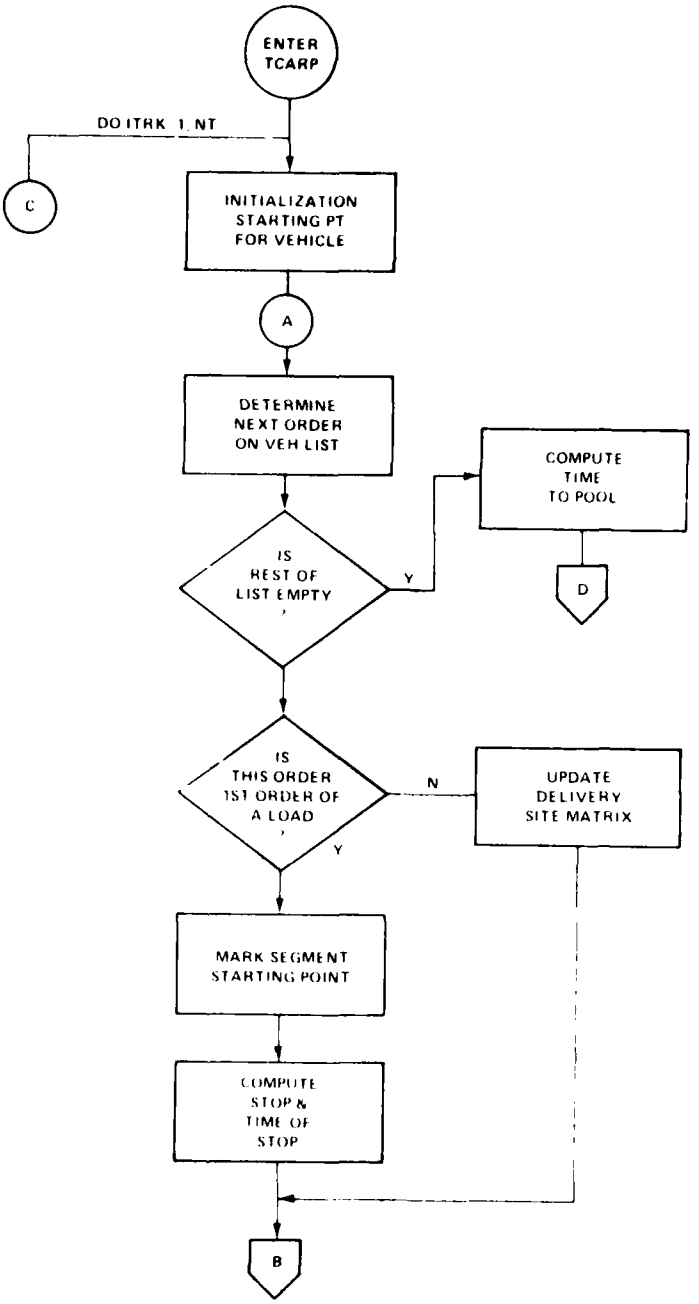
 1                   FUNCTION T(IAREAO,IAREAT,K)                                    T       2
                C                                                                  T       3
                C    THIS FUNCTION GIVES THE TRAVEL TIME BETWEEN POINTS IO AND IT  T       4
                C    FOR TRUCK TYPE K                                              T       5
 5              C    TIMES ARE STORED IN TRIANGULAR ARRAYS WITH ZERO ON THE DIAGONAL T       6
                C                                                                  T       7
                     ALPHA WHNAM                                                   T       8
                C       *** COMMONS ***                                            T       9
                     COMMON/TIMTAB/ TTIME(3,65),TTIM2(6)                           T      10
10                   COMMON/WHOUSE/ WHAAM(92)                                      T      11
                C                                                                  T      12
                C                                                                  T      13
                C    NGROUP MUST BE CHANGED IF WAREHOUSE GROUPING CHANGES          T      14
                C                                                                  T      15
15                   NGROUP = 10                                                   T      16
                     KSAVE=K                                                       T      17
                     IF(K.EQ.4) K=1                                                T      18
                1000 IF(IAREAO.EQ.IAREAT) GO TO 6500                               T      19
                1500 IF(IAREAO.GT.NGRUP.OR.IAREAT.GT.NGRUP) GO TO 5000             T      20
20              C                                                                  T      21
                C    FIND TIME FOR SITES IN DIFFERENT AREAS                        T      22
                C                                                                  T      23
                     L=MIN0(IAREAO,IAREAT)                                         T      24
                     M=MAX0(IAREAO,IAREAT)                                         T      25
25                   IF(L.EQ.1) GO TO 3000                                         T      26
                     N = L - 1                                                     T      27
                     ISUM = 4                                                      T      28
                     DO 2000 IX = 1, N                                             T      29
                2000 ISUM = ISUM + (NGROUP - IX)                                   T      30
30                   IL = ISUM - L                                                 T      31
                     T=TTIME(K,IL)                                                 T      32
                     GO TO 6000                                                    T      33
                3000 T = TTIME(K,M-1)                                              T      34
                     GO TO 6000                                                    T      35
35              4000 T = 0.0                                                       T      36
                     GO TO 6000                                                    T      37
                C                                                                  T      38
                C    FIND TIME FOR SITES IN SAME AREA                              T      39
                C                                                                  T      40
40              4500 T = 2.0                                                       T      41
                     GO TO 6000                                                    T      42
                C                                                                  T      43
                C    FIND TIME FOR OFFBASE SITES                                   T      44
                C                                                                  T      45
45              5000 IF(IAREAO.GT.NGRUP.AND.IAREAT.GT.NGRUP) GO TO 5500            T      46
                     IF(K.NE.3) GO TO 5500                                         T      47
                     N=MAX0(IAREAO,IAREAT)                                         T      48
                     N = N - NGRUP                                                 T      49
                     T = TTIM2(N)                                                  T      50
50                   GO TO 6000                                                    T      51
                C                                                                  T      52
                C    T = 1000. PREVENTS TRAVEL BETWEEN OFFBASE SITES               T      53
                C                                                                  T      54
                5500 T=1000.0                                                      T      55
55              6000 K=KSAVE                                                       T      56
                     RETURN                                                        T      57
                     END                                                           T      58
```

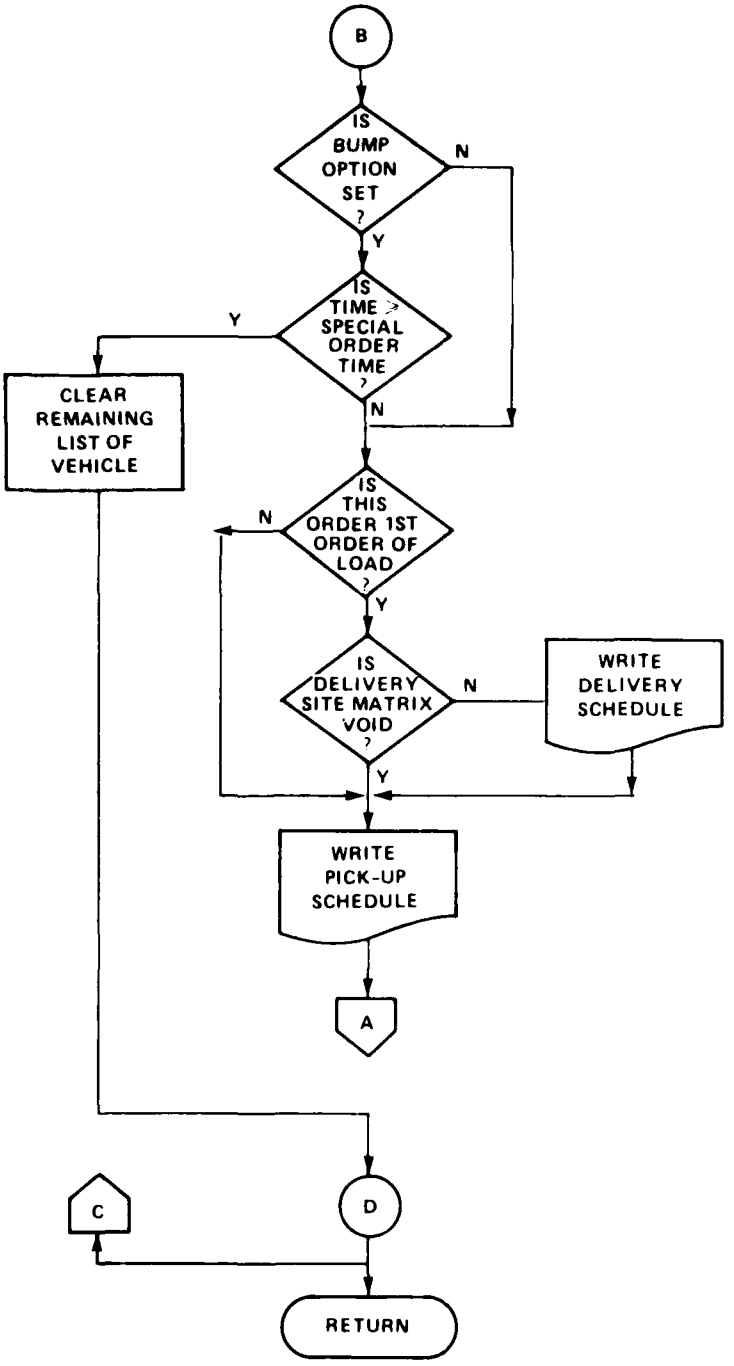
ROUTINE: TCARP

Description:

The primary purpose of TCARP is to translate the linked lists notation for each vehicle in service into readable schedules.

When the bump option is set for a special order run (AVS2), TCARP traces through each vehicle's schedule to determine whether the vehicle is suitable to move special orders. Each suitable vehicle is made available for the special order run.


ENTER TCARP
DO ITRK 1, NT
C
INITIALIZATION STARTING PT FOR VEHICLE
A
DETERMINE NEXT ORDER ON VEH LIST
IS REST OF LIST EMPTY
Y
COMPUTE TIME TO POOL
D
IS THIS ORDER 1ST ORDER OF A LOAD
N
Y
UPDATE DELIVERY SITE MATRIX
MARK SEGMENT STARTING POINT
COMPUTE STOP & TIME OF STOP
B


B
IS BUMP OPTION SET ?
N
Y
IS TIME > SPECIAL ORDER TIME ?
Y
CLEAR REMAINING LIST OF VEHICLE
N
IS THIS ORDER 1ST ORDER OF LOAD ?
N
Y
IS DELIVERY SITE MATRIX VOID ?
N
WRITE DELIVERY SCHEDULE
Y
WRITE PICK-UP SCHEDULE
A
C
D
RETURN

```
      SUBROUTINE TCARP                                                  TCARP  2
C*****************************************************************    TCARP  3
C                                                                       TCARP  4
C     TCARP - DECODES SCHEDULES FROM THE LINKED LISTS                   TCARP  5
C     FOR EACH VEHICLE USED                                             TCARP  6
C     IT ALSO PRINTS ALL UNMOVED ORDERS                                 TCARP  7
C                                                                       TCARP  8
C*****************************************************************    TCARP  9
C                                                                       TCARP 10
      INTEGER ONUMB,TRUCK,PTSOR,PTTRK,NDEST(15)                         TCARP 11
      INTEGER TRKSAV,CAPAC                                              TCARP 12
      ALPHA WHNAM,TYPE(4),PRTS(2),IPRT                                  TCARP 13
      REAL LTIME                                                        TCARP 14
      COMMON                                                            TCARP 15
     */GEN/ RTTIM,MINLD(4)                                              TCARP 16
     */MSGLNS/ NORDR,NTRKS(4),PTTRK(4)                                  TCARP 17
     */SAVEP/ NSAV(4),TRKSAV(4)                                         TCARP 18
     */SPORD/ ICNTRL,SAVTIM,ISORD                                       TCARP 19
     */WHOUSE/ WHNAM(92)                                                TCARP 20
     */SCHEDL/ ONUMB(200),INFO(200),IDESTP(200),IAREA(200),LFRWD(200),  TCARP 21
     *     LBKWD(200),LCFWD(200),LCBWD(200),ATIME(200),STOPT(200)       TCARP 22
     */TRUCKS/ PTSOR(50),TRUCK(50),CAPAC(50),STIME(50),LTIME(50),       TCARP 23
     *     RTLIM(50),TLEFT(50),NT                                       TCARP 24
     */INOPT/ SHIFT,IDATE                                               TCARP 25
      DATA TYPE/2HST,2HTR,2HTT,2HIT/                                    TCARP 26
      DATA PRTS/6H      ,6H*SPCL* /                                     TCARP 27
C      LIST ALL UNMOVED ORDERS                                          TCARP 28
      PRTSHF=SHIFT                                                      TCARP 29
      SAVSHF=0.0                                                        TCARP 30
      IPCOL=23                                                          TCARP 31
      JA1=2                                                             TCARP 32
      DO 1000 JJ=1,4                                                    TCARP 33
      IF(NTRKS(JJ).LE.0) GO TO 1000                                     TCARP 34
      NSTART=NTRKS(JJ)                                                  TCARP 35
      DO 2000 I=1,NSTART                                                TCARP 36
      ITRK=PTTRK(JJ)+I                                                  TCARP 37
      IF(PTSOR(ITRK).LE.0) GO TO 2000                                   TCARP 38
      NPALTS=0                                                          TCARP 39
      ISTOP=0                                                           TCARP 40
      TIME=0.0                                                          TCARP 41
      LSTOP=IPOOL                                                       TCARP 42
      IA1=JA1                                                           TCARP 43
      NOFL=0                                                            TCARP 44
      LINK=PTSOR(ITRK)                                                  TCARP 45
      LNKSAV=LINK                                                       TCARP 46
C      DETERMINE VEHICLE TYPE                                           TCARP 47
      ITYPE=1                                                           TCARP 48
      IF(ITRK.GT.PTTRK(2)) ITYPE=2                                      TCARP 49
      IF(ITRK.GT.PTTRK(3)) ITYPE=3                                      TCARP 50
      IF(ITRK.GT.PTTRK(4)) ITYPE=4                                      TCARP 51
      JORIG=0                                                           TCARP 52
       ITIME=SHIFT                                                      TCARP 53
      IVEH=ITRK-TRKSAV(ITYPE)                                           TCARP 54
      IF(TRKSAV(ITYPE).LT.0) IVEH=ITRK-PTTRK(ITYPE)                     TCARP 55
      IF(ICNTRL.EQ.0) GO TO 2010                                        TCARP 56
      IPRT=PRTS(1)                                                      TCARP 57
      WRITE(6,602) TYPE(ITYPE),IVEH,SHIFT,IDATE                         TCARP 58
```

```
SUBROUTINE TCARP       74/74   OPT=0 ROUND=*/ TRACE          FTN 4.6+460        10/17/80  10.04.12

      2010 INFO(LINK)=IABS(INFO(LINK))                                          TCARP 59
           IF(ICNTRL.NE.0) GO TO 2014                                           TCARP 60
60         IF(IABS(IDESTP(LINK)).NE.1) GO TO 2015                               TCARP 61
           IF(ITIME.LT.IFIX(SAVTIM)) GO TO 2015                                 TCARP 62
C          CLEAR VEHICLE SCHEDULE                                               TCARP 63
      2025 INFO(LINK)=IABS(INFO(LINK))                                          TCARP 64
           IDESTP(LINK)=0                                                       TCARP 65
65         LAST=LBKWD(LINK)                                                     TCARP 66
           LFRWD(LAST)=0                                                        TCARP 67
           LBKWD(LINK)=0                                                        TCARP 68
           STOPT(LINK)=0.0                                                      TCARP 69
           ATIME(LINK)=0.0                                                      TCARP 70
70         LINK=LFRWD(LINK)                                                     TCARP 71
           IF(LINK.GT.0) GO TO 2025                                             TCARP 72
C          UPDATE TIME REMAINING FOR VEHICLE                                    TCARP 73
           ISS=SHIFT                                                            TCARP 74
           XSHFT=(ISS/100)*60+MOD(ISS,100)                                      TCARP 75
75         TLEF=(ITIME/100)*60+MOD(ITIME,100)                                   TCARP 76
           TLEF=RTTIM-(TLEF-XSHFT)                                              TCARP 77
           TLEFT(ITRK)=TLEF                                                     TCARP 78
           GO TO 2005                                                           TCARP 79
      2015 LINKS=LFRWD(LINK)                                                    TCARP 80
80         IF(LINKS.GT.0) GO TO 2014                                            TCARP 81
           ISS=SHIFT                                                            TCARP 82
           XSHFT=(ISS/100)*60+MOD(ISS,100)                                      TCARP 83
           ISS=SAVTIM                                                           TCARP 84
           TLEFT(ITRK)=(ISS/100)*60+MOD(ISS,100)                                TCARP 85
85         TLEFT(ITRK)=RTTIM-(TLEFT(ITRK)-XSHFT)                                TCARP 86
      2014 IF(ATIME(LINK).GT.TIME) TIME=ATIME(LINK)                             TCARP 87
           IF(ATIME(LINK).NE.0.0) GO TO 2016                                    TCARP 88
           IF(SAVSHF.NE.0.0) GO TO 2016                                         TCARP 89
           SAVSHF=SHIFT                                                         TCARP 90
90         ISS=SHIFT                                                            TCARP 91
           XSHFT=(ISS/100)*60+MOD(ISS,100)                                      TCARP 92
           SHIFT=SAVTIM                                                         TCARP 93
           ISS=SAVTIM                                                           TCARP 94
           TME=(ISS/100)*60+MOD(ISS,100)                                        TCARP 95
95         TME=TME-XSHFT                                                        TCARP 96
           IF(TME.LE.TIME) GO TO 2016                                           TCARP 97
           IA1=2                                                                TCARP 98
           TIME=TME                                                             TCARP 99
      2016 CONTINUE                                                             TCARP100
100        IORIG=INFO(LINK)/10000                                               TCARP101
           IDEST=MOD(INFO(LINK)/100,100)                                        TCARP102
           ISIZE=MOD(INFO(LINK),100)                                            TCARP103
           NPALTS=NPALTS+ISIZE                                                  TCARP104
           NDEL=NDEL+1                                                          TCARP105
105        NDEST(NDEL)=IDEST                                                    TCARP106
           IA2=IAREA(LINK)/100                                                  TCARP107
           IF(IORIG.EQ.JORIG) GO TO 4005                                        TCARP108
           ATIME(LINK)=TIME+T(IA1,IA2,ITYPE)                                    TCARP109
           TIME=ATIME(LINK)                                                     TCARP110
110        ITIME=TCONV(TIME,PRTSHF)                                             TCARP111
           STAY=LTIME(ITRK)*FLOAT(ISIZE)+STIME(ITRK)                            TCARP112
           TIME=TIME+STAY                                                       TCARP113
           ISTAY=STAY+.9                                                        TCARP114
           ISTOP=ISTOP+1                                                        TCARP115
```

```
                      IF(ICNTRL.EQ.0) GO TO 8000                          TCARP116
                      NUM=IABS(ONUMB(LINK))                               TCARP117
                      IF(ONUMB(LINK).GE.0) GO TO 101                      TCARP118
                      IPRT=PRTS(2)                                        TCARP119
                      IF(NUM.LE.100) IPRT=6H*SPLIT                        TCARP120
                      NUM=MOD(NUM,100)                                    TCARP121
                101   WRITE(6,603) ISTOP,WHNAM(IORIG),ITIME,ISIZE,NUM,ISTAY,IPRT  TCARP122
                      IPRT=PRTS(1)                                        TCARP123
                8000  JORIG=IORIG                                         TCARP124
                      GO TO 4010                                          TCARP125
                4005  STAY=LTIME(ITRK)*FLOAT(ISIZE)                       TCARP126
                      ISTAY=STAY+.9                                       TCARP127
                      ATIME(LINK)=TIME                                    TCARP128
                      TIME=TIME+STAY                                      TCARP129
                      IF(ICNTRL.EQ.0) GO TO 4010                          TCARP130
                      NUM=IABS(ONUMB(LINK))                               TCARP131
                      IF(ONUMB(LINK).GE.0) GO TO 102                      TCARP132
                      IPRT=PRTS(2)                                        TCARP133
                      IF(NUM.LE.100) IPRT=6H*SPLIT                        TCARP134
                      NUM=MOD(NUM,100)                                    TCARP135
                102   WRITE(6,605) ISIZE,NUM,ISTAY,IPRT                   TCARP136
                      IPRT=PRTS(1)                                        TCARP137
                4010  JDEST=0                                             TCARP138
                      NEXT=LFRWD(LINK)                                    TCARP139
                      NXTSAV=NEXT                                         TCARP140
                      IF(NEXT.LE.0) GO TO 2020                            TCARP141
                      IF(IDESTP(LINK).EQ.IDESTP(NEXT)) GO TO 3000         TCARP142
                      IF(ITYPE.EQ.1) GO TO 4000                           TCARP143
                      IF(IDESTP(LINK).LT.IDESTP(NEXT)) GO TO 3200         TCARP144
                      GO TO 5000                                          TCARP145
                4000  IF(IDESTP(LINK).GT.IDESTP(NEXT)) GO TO 3100        TCARP146
                5000  LINK=NEXT                                           TCARP147
                      LSTOP=IORIG                                         TCARP148
                      IA1=IA2                                             TCARP149
                      GO TO 2010                                          TCARP150
                C      COMPUTE TIME ONE DESTINATION                       TCARP151
                3000  IA2=MOD(IAREA(LINK),100)                            TCARP152
                      TIME=TIME+T(IA1,IA2,ITYPE)                          TCARP153
                      STOPT(LINK)=TIME                                    TCARP154
                      ISTOP=ISTOP+1                                       TCARP155
                      ITIME=TCONV(TIME,PRTSHF)                            TCARP156
                      STAY=LTIME(ITRK)*FLOAT(ISIZE)+STIME(ITRK)           TCARP157
                      TIME=TIME+STAY                                      TCARP158
                      ISTAY=STAY+.9                                       TCARP159
                      IF(ICNTRL.EQ.0) GO TO 8001                          TCARP160
                      NUM=IABS(ONUMB(LINK))                               TCARP161
                       IF(ONUMB(LINK).GE.0) GO TO 103                     TCARP162
                      IPRT=PRTS(2)                                        TCARP163
                      IF(NUM.LE.100) IPRT=6H*SPLIT                        TCARP164
                      NUM=MOD(NUM,100)                                    TCARP165
                103   WRITE(6,604) ISTOP,WHNAM(IDEST),ITIME,ISIZE,NUM,ISTAY,IPRT  TCARP166
                      IPRT=PRTS(1)                                        TCARP167
                8001  JDEST=0                                             TCARP168
                      JORIG=IDEST                                         TCARP169
                      LINK=NEXT                                           TCARP170
                      LNKSAV=NEXT                                         TCARP171
                      NOEL=0                                              TCARP172
```

```
                IA1=IA2                                                 TCARP173
                LSTOP=IDEST                                             TCARP174
                GO TO 2010                                              TCARP175
175           C      FIRST ON - FIRST OFF                               TCARP176
             2020 IF(ITYPE.EQ.1) GO TO 3100                             TCARP177
                IA1=IA2                                                 TCARP178
                LNKSAV=LINK                                             TCARP179
                GO TO 3210                                              TCARP180
180          3100 IF(NDEL.EQ.0) GO TO 7000                              TCARP181
                DO 6000 II=1,NDEL                                       TCARP182
                IDEST=NDEST(II)                                         TCARP183
                IA2=MOD(IAREA(LNKSAV),100)                              TCARP184
                ISIZE=MOD(INFO(LNKSAV),100)                             TCARP185
185             IF(JDEST.NE.IDEST) GO TO 3105                           TCARP186
                STOPT(LNKSAV)=TIME                                      TCARP187
                STAY=LTIME(ITRK)*FLOAT(ISIZE)                           TCARP188
                TIME=TIME+STAY                                          TCARP189
                ISTAY=STAY+.9                                           TCARP190
190             IF(ICNTRL.EQ.0) GO TO 3110                              TCARP191
                NUM=IABS(ONUMB(LNKSAV))                                 TCARP192
                IF(ONUMB(LNKSAV).GE.0) GO TO 104                        TCARP193
                IPRT=PRTS(2)                                            TCARP194
                IF(NUM.LE.100) IPRT=6H*SPLIT                            TCARP195
195           104 WRITE(6,607) ISIZE,NUM,ISTAY,IPRT                     TCARP196
                IPRT=PRTS(1)                                            TCARP197
                GO TO 3110                                              TCARP198
             3105 ISTOP=ISTOP+1                                         TCARP199
                JDEST=IDEST                                             TCARP200
200             TIME=TIME+T(IA1,IA2,ITYPE)                              TCARP201
                STOPT(LNKSAV)=TIME                                      TCARP202
                STAY=LTIME(ITRK)*FLOAT(ISIZE)+STIME(ITRK)               TCARP203
                TIME=TIME+STAY                                          TCARP204
                ISTAY=STAY+.9                                           TCARP205
205             ITIME=TCONV(STOPT(LNKSAV),PRTSHF)                       TCARP206
                IF(ICNTRL.EQ.0) GO TO 3110                              TCARP207
                NUM=IABS(ONUMB(LNKSAV))                                 TCARP208
                IF(ONUMB(LNKSAV).GE.0) GO TO 105                        TCARP209
                IPRT=PRTS(2)                                            TCARP210
210             IF(NUM.LE.100) IPRT=6H*SPLIT                            TCARP211
                NUM=MOD(NUM,100 )                                       TCARP212
              105 WRITE(6,604) ISTOP,WHNAM(IDEST),ITIME,ISIZE,NUM,ISTAY,IPRT TCARP213
                IPRT=PRTS(1)                                            TCARP214
             3110 IA1=IA2                                               TCARP215
215             LNKSAV=LFRWD(LNKSAV)                                    TCARP216
                LSTOP=IDEST                                             TCARP217
             6000 CONTINUE                                              TCARP218
                NDEL=0                                                  TCARP219
                IF(LNKSAV.LE.0) GO TO 7000                              TCARP220
220             LINK=LNKSAV                                             TCARP221
                JORIG=IDEST                                             TCARP222
                GO TO 2010                                              TCARP223
              C      FIRST ON - LAST OFF                                TCARP224
             3200 LNKSAV=LBKWD(NEXT)                                    TCARP225
225          3210 IA2=MOD(IAREA(LNKSAV),100)                            TCARP226
                IDEST=MOD(INFO(LNKSAV)/100,100)                         TCARP227
                ISIZE=MOD(INFO(LNKSAV),100)                             TCARP228
                IF(JDEST.NE.IDEST) GO TO 3205                           TCARP229
```

```
                STOPT(LNKSAV)=TIME                                      TCARP230
230             STAY=LTIME(ITRK)*FLOAT(ISIZE)                           TCARP231
                ISTAY=STAY+.9                                           TCARP232
                TIME=TIME+STAY                                          TCARP233
                IF(ICNTRL.EQ.0) GO TO 3220                              TCARP234
                NUM=IABS(ONUMB(LNKSAV))                                 TCARP235
235             IF(ONUMB(LNKSAV).GE.0) GO TO 106                        TCARP236
                IPRT=PRTS(2)                                            TCARP237
                IF(NUM.LE.100) IPRT=6H*SPLIT                            TCARP238
                NUM=MOD(NUM,100)                                        TCARP239
              106 WRITE(6,607) ISIZE,NUM,ISTAY,IPRT                     TCARP240
240             IPRT=PRTS(1)                                            TCARP241
                GO TO 3220                                              TCARP242
             3205 JDEST=IDEST                                           TCARP243
                ISTOP=ISTOP+1                                           TCARP244
                TIME=TIME+T(IA1,IA2,ITYPE)                              TCARP245
245             STOPT(LNKSAV)=TIME                                      TCARP246
                STAY=LTIME(ITRK)*FLOAT(ISIZE)+STIME(ITRK)               TCARP247
                TIME=TIME+STAY                                          TCARP248
                ISTAY=STAY+.9                                           TCARP249
                ITIME=TCONV(STOPT(LNKSAV),PRTSHF)                       TCARP250
250             IF(ICNTRL.EQ.0) GO TO 3220                              TCARP251
                NUM=IABS(ONUMB(LNKSAV))                                 TCARP252
                 IF(ONUMB(LNKSAV).GE.0) GO TO 107                       TCARP253
                IPRT=PRTS(2)                                            TCARP254
                IF(NUM.LE.100) IPRT=6H*SPLIT                            TCARP255
255             NUM=MOD(NUM,100)                                        TCARP256
              107 WRITE(6,604) ISTOP,WHNAM(IDEST),ITIME,ISIZE,NUM,ISTAY,IPRT TCARP257
                IPRT=PRTS(1)                                            TCARP258
             3220 IA1=IA2                                               TCARP259
                LSTOP=IDEST                                             TCARP260
260             NDEL=NDEL-1                                             TCARP261
                NEXT=LNKSAV                                             TCARP262
                IF(NDEL.GT.0) GO TO 3200                                TCARP263
                IF(NXTSAV.LE.0) GO TO 7000                              TCARP264
                LINK=NXTSAV                                             TCARP265
265             LNKSAV=NXTSAV                                           TCARP266
                JORIG=IDEST                                             TCARP267
                GO TO 2010                                              TCARP268
C               END ROUTE FOR VEHICLE                                   TCARP269
              7000 TIME=TIME+T(IA1,JA1,ITYPE)                           TCARP270
270             ITIME=TCONV(TIME,PRTSHF)                                TCARP271
                IF(ICNTRL.EQ.0) GO TO 2005                              TCARP272
                WRITE(6,606) WHNAM(IPOOL),ITIME,NPALTS                  TCARP273
              2005 IF(SAVSHF.LE.0.0) GO TO 2000                         TCARP274
                SHIFT=SAVSHF                                            TCARP275
275             SAVSHF=0.0                                              TCARP276
              2000 CONTINUE                                             TCARP277
              1000 CONTINUE                                             TCARP278
                DO 9000 I=1,NCRDR                                       TCARP279
                INFO(I)=IABS(INFO(I))                                   TCARP280
280             IF(IDESTP(I).EQ.0) GO TO 9000                           TCARP281
                INFO(I)=-INFO(I)                                        TCARP282
              9000 CONTINUE                                             TCARP283
                IF(ICNTRL.EQ.0) RETURN                                  TCARP284
                WRITE(6,600)                                            TCARP285
285             DO 9001 I=1,NCRDR                                       TCARP286
```

```
      SUBROUTINE TCARP      74/74   OPT=0 ROUND=*/ TRACE          FTN 4.6+460        10/17/80  10.04.12

                  IF(INFO(I).LE.0) GO TO 9001                                                  TCARP287
                  IO=IABS(INFO(I))/10000                                                       TCARP288
                  IT=MOD(IABS(INFO(I))/100,100)                                                TCARP289
                  ISIZE=MOD(IABS(INFO(I)),100)                                                 TCARP290
290               WRITE(6,601) CNUME(I),ISIZE,WHNAM(IO),WHNAM(IT)                              TCARP291
               9001 CONTINUE                                                                   TCARP292
                  RETURN                                                                       TCARP293
                600 FORMAT(1H1,50(1H*)/5X,18HORDERS NOT MOVED    /1X,50(1H*)///)             TCARP294
                601 FORMAT(1X,6HORDER ,I4,2H, ,I2,6HFROM ,A6,4H TO ,A6)                        TCARP295
295             602 FORMAT(1H1/// 20X,13HVEHICLE    -  ,A2,I2/20X,12HSTART TIME -  ,          TCARP296
                   * F5.0//20X,4HDATE,9X,I6///1H0,76(1H-)/6X,4HSTOP,2X,4HSITE,3X,4HTIME      TCARP297
                   *5X,7HDELIVER,7X,7HPICK UP ,5X,5HORDER,3X,15HSTAY TIME (MIN)  /           TCARP298
                   *1X,76(1H-)/)                                                             TCARP299
                603 FORMAT(7X,I3,1X,A6,1X,I5,17X,I2,8H PALLETS ,4X,I3,4X,I5,1X,A6)           TCARP300
300             604 FORMAT(7X,I3,1X,A6,1X,I5,3X,I2,8H PALLETS ,18X,I3,4X,I5,1X,A6)           TCARP301
                605 FORMAT(40X,I2,8H PALLETS ,4X,I3,4X,I5,1X,A6)                             TCARP302
                606 FORMAT(//20X,11HROUTE ENDED /20X,10HLOCATION = ,A6/                      TCARP303
                   * 20X,6HTIME = ,I5/20X,21HNO OF PALLETS MOVED =,I6)                       TCARP304
                607 FORMAT(26X,I2,8H PALLETS ,18X,I3,4X,I5,1X,A6)                            TCARP305
305               END                                                                          TCARP306
```

ROUTINE: TCONV

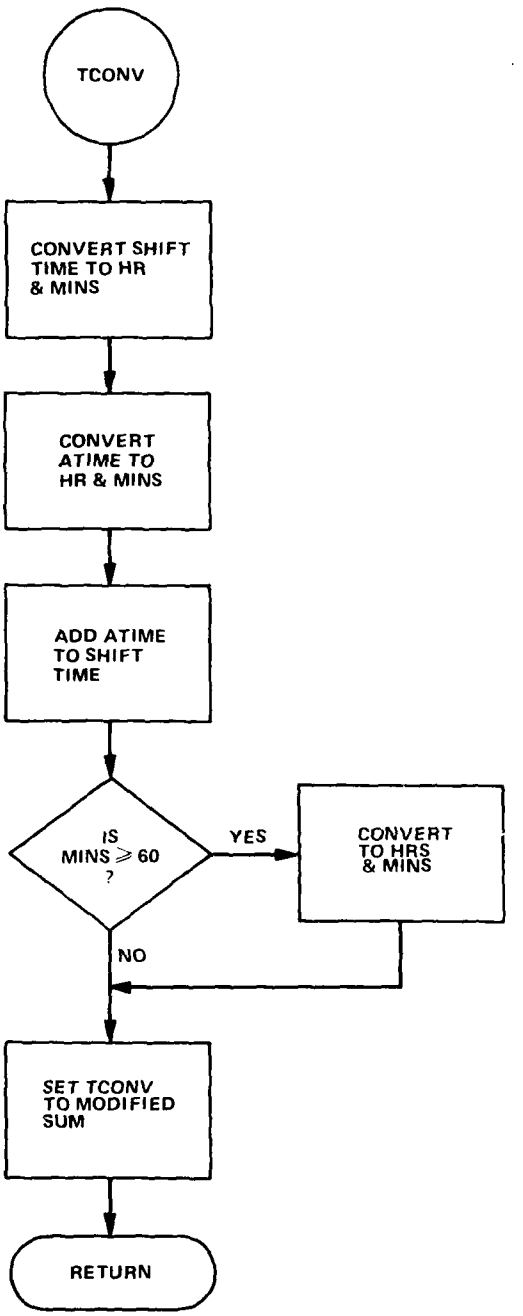
ARGUMENTS:

A - Relative time in minutes

S - Start of work shift (24-hour clock)

Description

TCONV adds the relative time to the start time of the shift. The sum is converted to 24-hour clock time. TCONV is then set equal to the result.


TCONV
CONVERT SHIFT TIME TO HR & MINS
CONVERT ATIME TO HR & MINS
ADD ATIME TO SHIFT TIME
IS MINS ⩾ 60 ?
YES
CONVERT TO HRS & MINS
NO
SET TCONV TO MODIFIED SUM
RETURN

```
      FUNCTION TCONV  74/74   OPT=0 ROUND=*/ TRACE          FTN 4.6+460      10/17/80  10.04.12

 1                FUNCTION TCONV(A,S)                                                  TCONV  2
            C                                                                          TCONV  3
            C     THIS FUNCTION TAKES REAL INPUTS A = REL. TIME IN MINUTES             TCONV  4
            C                                    AND S = START OF SHIFT (24 HR. CLOCK) TCONV  5
 5          C     ADDS A TO S AND OUTPUTS THE RESULT, TCONV, AS 24 HR. CLOCK TIME      TCONV  6
            C                                                                          TCONV  7
                  SHR = FLOAT(IFIX(S/100.))                                            TCONV  8
                  SMIN = S - SHR*100.                                                  TCONV  9
                  XHR = FLOAT(IFIX(A/60.))                                             TCONV 10
10                XMIN = A - XHR*60.                                                   TCONV 11
                  YMIN = SMIN + XMIN                                                   TCONV 12
                  YHR = SHR + XHR                                                      TCONV 13
                  TCONV = 100.*YHR + YMIN                                              TCONV 14
                  IF(YMIN.LT.60.) RETURN                                               TCONV 15
15                TCONV = TCONV + 40.                                                  TCONV 16
                  RETURN                                                               TCONV 17
                  END                                                                  TCONV 18
```

APPENDIX C - AVSIN1, A SINR COBOL DRIVER ROUTINE, LISTINGS

```
001030 IDENTIFICATION DIVISION.
001050 PROGRAM-ID.
001070      AVSIN1.
001090 AUTHOR.
001110      R.MELTON
001130 INSTALLATION.
001150      DTNSRDC.
001170 DATE-WRITTEN.
001190      14 DEC 78.
001210 DATE-COMPILED.
001230      14 DEC 78.
001250 SECURITY.
001270      UNCLASSIFIED.
001290 REMARKS.
001310      COMBINED INPUT-FRAME PROGRAM FOR AVS1 AND AVS2.
001330 ENVIRONMENT DIVISION.
001350 CONFIGURATION SECTION.
001370 SOURCE-COMPUTER.
001390      B3500.
001410 OBJECT-COMPUTER.
001430      B3500.
001450 INPUT-OUTPUT SECTION.
001470 FILE-CONTROL.
001490      SELECT SQFILE ASSIGN TO DISK
001510      RESERVE NO ALTERNATE AREAS
001530      ACCESS MODE IS RANDOM
001550      ACTUAL KEY IS SQFILE-KEY.
001610      SELECT VS2IN ASSIGN TO DISK
001630      RESERVE 1 ALTERNATE AREA.
001650      SELECT VS3IN ASSIGN TO DISK
001670      RESERVE 1 ALTERNATE AREA.
001690 DATA DIVISION.
001710 FILE SECTION.
001730 FD  SQFILE COPY SQFILE.
001750 01  AVS-RECORD.
001770      03 AVS-PREFIX PIC X(24).
001790      03 AVS-DATA PIC X(284).
001810 01  INPUT-DATA.
001830      03 FILLER PIC X(24).
001850      03 COMMON-PREFIX.
001870        05 DOCID PIC XXX.
001890        05 FRAME-NR PIC X.
001910      03 FILLER PIC X(280).
001930 01  FRAME-1-INPUT.
001950      03 FILLER PIC X(24).
001970      03 FILLER PIC X(4).
001990      03 ORDER OCCURS 20 TIMES.
002010        05 O-SIZE PIC XX.
002030        05 O-ORIG PIC XXXXXX.
002050        05 O-DEST PIC   X(6).
002070 01  FRAME-2-INPUT.
002090      03 FILLER PIC X(24).
002110      03 FILLER PIC X(4).
002130      03 TRUCK OCCURS 30 TIMES.
```

```
002150          05 V-USE PIC X.
002170          05 CAPAC PIC XX.
002190          05 TIME-LIM PIC XXX.
002210        03 FILLER PIC X(130).
002230  01 FRAME-5-INPUT.
002250        03 FILLER PIC X(24).
002270        03 FILLER PIC X(4).
002290        03 I-DATE PIC X(6).
002310        03 START-TIME PIC X(4).
002330        03 MAX-ROUTE PIC XXX.
002350        03 FILLER PIC X(256).
002370  01  FRAME-6-INPUT.
002390        03 FILLER PIC X(24).
002410        03 FILLER PIC X(4).
002430        03 M-OPTION PIC X.
002450        03 P-OPTION PIC X.
002470        03 FILLER PIC X(268).
002490  01  FRAME-7-INPUT.
002510        03 FILLER PIC X(24).
002530        03 FILLER PIC X(4).
002550        03 FCN-TYPE PIC X.
002570        03 START-DATE PIC X(6).
002590        03 H-OPTION PIC X.
002610        03 END-DATE PIC X(6).
002630        03 H-SHIFT PIC X(4).
002650        03 TODAY-DATE PIC X(6).
002670        03 TODAY-SHIFT PIC X(4).
002690        03 UPDATE-RECS OCCURS 6 TIMES.
002710          05 ORIGH PIC X(6).
002730          05 DESTH PIC X(6).
002750          05 SIZEH PIC XX.
002770          05 VEHH PIC X(4).
002790          05 EMERH PIC X.
002810          05 APLEH PIC X.
002830        03 FILLER PIC X(122).
002930 FD  VS2IN  FILE CONTAINS 20 BY 1000 RECORDS
002950          RECORD CONTAINS 80 CHARACTERS
002970          DATA RECORD IS CARD-IMAGE.
002990 01  CARD-IMAGE PIC X(80).
003010 FD  VS3IN FILE CONTAINS 20 BY 1000 RECORDS
003030        RECORD CONTAINS 80 CHARACTERS
003050        DATA RECORD IS CARD-IMAGE2.
003070 01  CARD-IMAGE2 PIC X(80).
003090 WORKING-STORAGE SECTION.
003110 77  PROGRAM-NAME  PIC X(6) VALUE "AVSIN1".
003130 77  ERR-CNT PIC 9999 COMP.
003150 77  LLAST PIC 9999 COMP VALUE ZEROES.
003170 77  JJ PIC 9999 COMP VALUE ZEROES.
003190 77  HIST-CHECK PIC X VALUE SPACE.
003210 77  STRAD-CAPAC  PIC XX VALUE "05".
003230 77  TRANS-CAPAC PIC XX VALUE "10".
003250 77  TRAILER-CAPAC PIC XX VALUE "14".
003270 77  MAX-CAPAC PIC XX.
003290 77  EMER-CHECK PIC X VALUE SPACE.
003310 77  SAME-REC PIC X VALUE SPACE.
```

```
003330 77  J-DSP PIC 99.
003350 77  J PIC 9999 COMP.
003370 77  M PIC 99 COMP.
003390 77  K PIC 99 COMP.
003410 77  JLAST PIC 99 COMP.
003430 77  KLAST PIC 99 COMP.
003450 77  J-FLAG PIC 9 COMP.
003470 77  K-FLAG PIC 9 COMP.
003490 77  ORDERS-FULL PIC 9 COMP.
003510 77  ONE PIC 9 COMP VALUE 01.
003530 77  KCHECK PIC 99 COMP.
003550 77  BASE-NR PIC 99.
003570 77  TYPE-CT PIC 99.
003590 77  TEST-NAME PIC X(6).
003610 77  TRUCK-TYPE PIC XX.
003630 77  OPTION PIC X VALUE "2".
003650 01  SQSTOR COPY SQSTOR.
003670 01  I-WORK-AREA COPY ISTORE.
003690 01  AVS1-EXECUTE PIC X(40)
003710       VALUE "EX AVS1  CG 162904 .".
003730 01  AVS2-EXECUTE PIC X(40)
003750       VALUE "EX AVS2  CG 162904 .".
003770 01  AVS3-EXECUTE PIC X(40) VALUE
003790       "EX AVS3 CG 162904.".
003810 01  TYPE-CT-DSP.
003830     03 FIRST-DIG PIC 9.
003850     03 SECOND-DIG PIC 9.
003870 01  ORDER-STORE.
003890     03 ORDER-OUTPUT OCCURS 99 TIMES.
003910       05 OUT-SIZE PIC XX.
003930       05 OUT-ORIG PIC X(6).
003950       05 OUT-DEST PIC X(6).
003970 01  TRUCK-STORE.
003990     03 TRUCK-OUTPUT OCCURS 50 TIMES.
003995       05 TRK-USE PIC X.
004010       05 TRUCK-NUM PIC XX.
004030       05 TRUCK-CAPAC PIC XX.
004050       05 TRUCK-TIME-LIM PIC XXX.
004070 01 OPT-STORE.
004090     03 M-OPTS PIC X.
004110     03 P-OPTS PIC X.
004130 01  FRAME-1-OUTPUT.
004150     03 LAST-OPD-PROC PIC XX.
004170     03 ERR-FIELD-1 OCCURS 10 TIMES.
004190       05 ORDER-NR PIC XX.
004210       05 EXPLANATION-1 PIC X(20).
004230 01  FRAME-2-OUTPUT.
004250     03 ERR-FIELD-2 OCCURS 8 TIMES.
004270       05 V-NAME.
004290           07 V-TYPE PIC XX.
004310         07 V-NUMB PIC X.
004330       05 EXPLANATION-2 PIC X(20).
004350     03 LAST-TRUCK-FREE.
004370       05 LAST-TYPE PIC XX.
004390       05 LAST-NUMB PIC X.
```

```
004410 01  FRAME-3-OUTPUT.
004430     03 ERR-FIELD-3 OCCURS 6 TIMES.
004450       05 INPUT-ERROR   PIC X(4).
004470       05  EXPLANATION-3 PIC X(23).
004490 01  FRAME-6-OUTPUT.
004510     03 OUT-MIX PIC X.
004530     03 OUT-OPTION PIC X.
004550 01  FRAME-7-OUTPUT.
004570     03 ERR-FIELD-4 OCCURS 6 TIMES.
004590       05 INPUT-ERR PIC X(4).
004610       05 EXPLANATION-4 PIC X(19).
004630 01  OPT-CARD.
004650     03 O-OPT PIC X.
004670     03 FILLER PIC X(79) VALUE SPACES.
004690 01  DATE-CARD.
004710     03 O-DATE PIC X(6).
004730     03 FILLER PIC X(74) VALUE SPACES.
004750 01  SHIFT-CARD.
004770     03 O-SHIFT PIC X(4) VALUE SPACES.
004790     03 FILLER PIC X(76) VALUE SPACES.
004810 01  OPT-CARD-E.
004830     03 O-MIX PIC X VALUE "0".
004850     03 FILLER PIC X VALUE SPACE.
004870     03 PROPT PIC X VALUE "0".
004890     03 FILLER PIC X(77) VALUE SPACES.
004910 01  ORDER-CARD.
004930     03 O-SIZE PIC XX.
004950     03 FILLER PIC X VALUE SPACE.
004970     03 O-ORIGIN PIC X(6).
004990     03 FILLER PIC X VALUE SPACE.
005010     03 O-DESTIN PIC X(6).
005030     03 FILLER PIC X(64) VALUE SPACES.
005050 01  ORDER-CARD-E.
005070     03 O-TIME PIC X(4).
005090     03 FILLER PIC XX VALUE SPACES.
005110     03 O-SIZ PIC XX.
005130     03 FILLER PIC X VALUE SPACE.
005150     03 O-ORIGN PIC X(6).
005170     03 FILLER PIC X VALUE SPACE.
005190     03 O-DESTN PIC X(6).
005210     03 FILLER PIC X(54) VALUE  SPACES.
005230 01  END-CARD.
005250     03 C-END-SYMBOL PIC XX VALUE "-1".
005270     03 FILLER PIC X(78) VALUE SPACES.
005290 01  TRUCK-HEADER-CARD-R.
005310     03 O-TRUCK-TITLE-R PIC X(6) VALUE "TRUCKS".
005330     03 FILLER PIC X VALUE SPACE.
005350     03 O-NUMB-STS-R PIC XX.
005370     03 FILLER PIC X VALUE SPACE.
005390     03 O-NUMB-TRS-R PIC XX.
005410     03 FILLER PIC X VALUE SPACE.
005430     03 O-NUMB-TTS-R PIC XX.
005450     03 FILLER PIC X VALUE SPACE.
005470     03 O-ALL-LIM-R PIC XXXX.
005490     03 FILLER PIC X(60) VALUE SPACES.
```

```
005510 01   TRUCK-HEADER-CARD.
005530      03 O-TRUCK-TITLE PIC X(6) VALUE "TRUCKS".
005550      03 FILLER PIC X VALUE SPACE.
005570      03 O-NUMB-STS PIC X.
005590      03 FILLER PIC X VALUE SPACE.
005610      03 O-NUMB-TRS PIC X.
005630      03 FILLER PIC X VALUE SPACE.
005650      03 O-NUMB-TTS PIC X.
005670      03 FILLER PIC X VALUE SPACE.
005690      03 O-ALL-LIM PIC XXXX.
005710      03 FILLER PIC X(69) VALUE SPACES.
005730 01   TRUCK-CARD.
005750      03 TRK-USE-IT PIC X.
005770      03 O-TRUCK-CODE PIC XX.
005790      03 FILLER PIC X VALUE SPACE.
005810      03 O-TRUCK-TIME PIC XXX.
005830      03 FILLER PIC X VALUE SPACE.
005850      03 O-TRUCK-CAPAC PIC XX.
005870      03 FILLER PIC X(70) VALUE SPACES.
005870 01   FCN-2-SAVE.
005890      03 FCN-2-RECS OCCURS 6 TIMES.
005910        05 ORIGS PIC X(6).
005930        05 DESTS PIC X(6).
005950        05 SIZES PIC XX.
005970        05 VEHS PIC X(4).
005990        05 EMERS PIC X.
006010        05 RPLES PIC X.
        01  AVS1-HEADER-CARD.
            03  FILLER PIC X(5) VALUE " AVS1".
            03  FILLER PIC X(75) VALUE SPACES.
        01  AVS2-HEADER-CARD.
            03  FILLER PIC X(5) VALUE " AVS2".
            03  FILLER PIC X(75) VALUE SPACES.
006030 01   FCN-ALL-CARD.
006050      03 FCN PIC X.
006070      03 DATE1 PIC X(6) VALUE SPACES.
006090      03 DATE2 PIC X(6) VALUE SPACES.
006110      03 SHIFT-ALL PIC X(4) VALUE SPACES.
006130      03 OPTION-H PIC X VALUE SPACE.
006150      03 FILLER PIC X(62) VALUE SPACES.
006170 01   FCN-2-CARD.
006190      03 DATE-SAVE PIC X(6).
006210      03 SHIFT-SAVE PIC X(5).
006230      03 FILLER PIC X VALUE SPACE.
006250      03 VEH-NO PIC X(4).
006270      03 ORIG-SAVE PIC X(6).
006290      03 DEST-SAVE PIC X(6).
006310      03 FILLER PIC X(3) VALUE SPACES.
006330      03 SIZE-SAVE PIC XX.
006350      03 EMERG-SAVE PIC X.
006370      03 RPLE-SAVE PIC X.
006390      03 FILLER PIC X(45).
006410 01   WAREHOUSE-DATA.
006430      03  FILLER    PIC X(114)    VALUE
006450      "191   1601A 1C013 1C02  1603  1604  1605  1606  1621  1622
```

```
006470-     "46    53C   64E   64W   66E   66W   67E   67W   198   ".
006490      03  FILLER   PIC X(114)   VALUE
006510      "1127  113A  SM    2     3     5     8     35    43C   44
006530-     "59    223   1502  1503  1507  80    177   1143  1199  ".
006550      03  FILLER   PIC X(114)   VALUE
006570      "187   216   218   1013  1169  1171  1173  1172  1174  X10
006590-     "193   22W   3C    43S   61    84    202   646   647   ".
006610      03  FILLER   PIC X(102)   VALUE
006630      "656   1     7     16    23    26    53S   X54   ABASE NWS
006650-     "DEYTN BRASW CSNWS NMEDC 1078  98    655   ".
006670      03 FILLER PIC X(48) VALUE
006690      "L     M     N     P     Q     R     S     T     ".
006710 01   WAREHOUSE-NAME. REDEFINES WAREHOUSE-DATA.
006730      02 W-NAME. OCCURS 82 TIMES. PIC X(6).
006750 01   PATCH-AREA PIC X(200).
006770 PROCEDURE DIVISION.
006790 010-START-PROGRAM SECTION.
006810 011-START.
006830      PERFORM I-START.
006850 020-OPEN-FILE SECTION 51.
006870 021-OPEN.
006890      COPY SOOPIN.
006910 030-PROCESS SECTION.
006930 031-INITIALIZE.
006950      MOVE ZERO TO JLAST.
006970      MOVE ZERO TO KLAST.
006990      MOVE  ZERO TO ORDERS-FULL.
006995      MOVE ZERO TO LLAST.
007010 040-READ.
007030      MOVE ONE TO K.
007050      MOVE "00" TO J-DSP.
007070      MOVE SPACES TO FRAME-1-INPUT.
007090      MOVE SPACES TO FRAME-2-INPUT.
007110      MOVE SPACES TO FRAME-3-INPUT.
007130      MOVE SPACES TO FRAME-6-INPUT.
007150      MOVE SPACES TO FRAME-7-INPUT.
007170      PERFORM SOREAD.
007190      IF FRAME-NR EQUALS "1" GO TO 100-FRAME-1.
007210      IF FRAME-NR EQUALS "2" GO TO 200-FRAME-2.
007230      IF FRAME-NR EQUALS "3" GO TO 300-FRAME-3.
007250      IF FRAME-NR EQUALS "4" GO TO 400-OUTPUT.
007270      IF FRAME-NR EQUALS "5" GO TO 600-EMERGENCY-INPUT.
007290      IF FRAME-NR EQUALS "6" GO TO 599-CLEAR-RESTART.
007310      IF FRAME-NR EQUALS "7" GO TO 700-HISTORY.
007330      GO TO 040-READ.
007350 100-FRAME-1.
007370      IF ORDERS-FULL EQUALS ONE MOVE "99" TO J-DSP
007390              GO TO 120-LAST-ORDER.
007410      MOVE ZERO TO K-FLAG.
007430      MOVE ONE TO J.
007450      MOVE "01" TO J-DSP.
007470      MOVE ONE TO K.
007490 110-NEXT-ORDER.
007510      MOVE ZERO TO J-FLAG.
007530      IF O-SIZE (J) EQUALS SPACES
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007550         IF O-ORIG (J) EQUALS SPACES
007570           IF O-DEST (J) EQUALS SPACES
007590               SUBTRACT 1 FROM J-DSP
007610               GO TO 120-LAST-ORDER.
007630       IF O-SIZE (J) NOT NUMERIC
007650         IF K-FLAG EQUALS ONE GO TO 120-LAST-ORDER
007670         ELSE MOVE J-DSP TO ORDER-NR (K)
007690         MOVE "SIZE NOT NUMERIC " TO EXPLANATION-1 (K)
007710       MOVE ONE TO J-FLAG
007730       ADD ONE TO K
007750       IF K GREATER THAN 10 MOVE ONE TO K-FLAG.
007770       MOVE O-ORIG (J) TO TEST-NAME.
007790       PERFORM  500-NAME-TEST.
007810       IF TEST-NAME NOT EQUAL O-ORIG (J)
007830       IF K-FLAG EQUALS ONE GO TO 120-LAST-ORDER
007850         ELSE MOVE J-DSP TO ORDER-NR (K)
007870         MOVE "ORIGIN MISMATCH" TO EXPLANATION-1 (K)
007890       MOVE ONE TO J-FLAG
007910         ADD ONE TO K
007930         IF K GREATER THAN 10 MOVE ONE TO K-FLAG.
007950       MOVE O-DEST (J) TO TEST-NAME.
007970       PERFORM  500-NAME-TEST.
007990       IF TEST-NAME NOT EQUAL O-DEST (J)
008010         IF K-FLAG EQUALS ONE GO TO 120-LAST-ORDER
008030         ELSE MOVE J-DSP TO ORDER-NR (K)
008050         MOVE "DESTINATION MISMATCH" TO EXPLANATION-1 (K)
008070         MOVE ONE TO J-FLAG
008090       ADD ONE TO K
008110         IF K GREATER THAN 10 MOVE ONE TO K-FLAG.
008130       IF J-FLAG NOT EQUAL ONE
008150         ADD ONE TO JLAST
008170         IF JLAST GREATER THAN 99 MOVE ONE TO ORDERS-FULL
008190       GO TO 120-LAST-ORDER
008210         ELSE MOVE O-SIZE (J) TO OUT-SIZE (JLAST)
008230           MOVE O-ORIG (J) TO OUT-ORIG   (JLAST)
008250           MOVE O-DEST (J) TO OUT-DEST (JLAST).
008270       ADD ONE TO J.
008290       IF J GREATER THAN 20 GO TO 120-LAST-ORDER.
008310       ADD 1 TO J-DSP.
008330       GO TO 110-NEXT-ORDER.
008350 120-LAST-ORDER.
008370       MOVE J-DSP TO LAST-ORD-PROC.
008390       MOVE 226 TO SQFILE-RECORD-SIZE.
008410       MOVE 15 TO SQFILE-ROW.
008430 150-WRITE.
008450       COPY SQWRIT REPLACING SQWRIT001 BY SQFILE-PREFIX
008470         SQWRIT002 BY FRAME-1-OUTPUT.
008490       MOVE SPACES TO FRAME-1-OUTPUT.
008510       GO TO 040-READ.
008530 200-FRAME-2.
008550       MOVE ZERO TO K-FLAG.
008570       MOVE ONE TO J.
008590       MOVE "01" TO J-DSP.
008610       MOVE ONE TO K.
008630       MOVE "ST" TO TRUCK-TYPE.
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008650      MOVE STRAD-CAPAC TO MAX-CAPAC.
008670  210-NEXT-TRUCK.
008690      MOVE ZERO TO J-FLAG.
008710      IF V-USE (J) EQUAL "S" MOVE "S" TO SAME-REG
008730        MOVE ZERO TO SECOND-DIG
008750        GO TO 230-LAST-TRUCK.
008770      IF V-USE (J) EQUALS SPACES GO TO 220-INCREMENT-J.
008790  212-USE-TRUCK.
008810      IF CAPAC (J) EQUALS SPACES MOVE MAX-CAPAC
008830        TO CAPAC (J).
008850      IF CAPAC (J) NOT NUMERIC
008870        IF K-FLAG EQUALS ONE GO TO 230-LAST-TRUCK
008890          ELSE PERFORM 213-DISP-VEH-NUM
008910            MOVE SECOND-DIG TO V-NUMB (K)
008930            MOVE TRUCK-TYPE TO V-TYPE (K)
008950            MOVE "CAPAC NOT NUMERIC" TO EXPLANATION-2 (K)
008970            MOVE ONE TO J-FLAG
008990            ADD ONE TO K
009010            IF K GREATER THAN 8 MOVE ONE TO K-FLAG.
009030      IF CAPAC (J) NUMERIC
009050        IF CAPAC (J) GREATER THAN MAX-CAPAC
009070          IF K-FLAG EQUALS ONE GO TO 230-LAST-TRUCK
009090          ELSE PERFORM 213-DISP-VEH-NUM
009110          MOVE SECOND-DIG TO V-NUMB (K)
009130          MOVE TRUCK-TYPE TO V-TYPE (K)
009150          MOVE "CAPAC TOO LARGE" TO EXPLANATION-2  (K)
009170          MOVE ONE TO J-FLAG
009190          ADD ONE TO K
009210          IF K GREATER THAN 8 MOVE ONE TO K-FLAG.
009230      IF TIME-LIM (J) EQUALS SPACES
009250        MOVE "240" TO TIME-LIM (J).
009270      IF TIME-LIM (J) NOT NUMERIC
009290        IF K-FLAG EQUALS ONE GO TO 230-LAST-TRUCK
009310          ELSE PERFORM 213-DISP-VEH-NUM
009330      MOVE SECOND-DIG TO V-NUMB (K)
009350          MOVE TRUCK-TYPE TO V-TYPE (K)
009370          MOVE " TIME NOT NUMERIC" TO EXPLANATION-2 (K)
009390          MOVE ONE TO J-FLAG
009410          ADD ONE TO K
009430          IF K GREATER THAN 8 MOVE ONE TO K-FLAG.
009450      IF J-FLAG EQUALS ONE GO TO 220-INCREMENT-J.
009470      MOVE ONE TO KCHECK.
009490  213-DISP-VEH-NUM.
009510      MOVE J-DSP TO BASE-NR.
009530      MOVE J-DSP TO TYPE-CT.
009550      IF J GREATER THAN 12 ADD 8 TO BASE-NR
009570        SUBTRACT 12 FROM TYPE-CT.
009590      IF J GREATER THAN 18 ADD 4 TO BASE-NR
009610        SUBTRACT 6 FROM TYPE-CT.
009630      MOVE TYPE-CT TO TYPE-CT-DSP.
009650  215-CHECK-LIST.
009670      IF KCHECK GREATER THAN KLAST GO TO 218-NEW-TRUCK.
009690      IF TRUCK-NUM (KCHECK) NOT EQUAL BASE-NR
009710        ADD ONE TO KCHECK
009730        GO TO 215-CHECK-LIST.
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009750      MOVE CAPAC (J) TO TRUCK-CAPAC (KCHECK).
009770      MOVE  TIME-LIM (J) TO TRUCK-TIME-LIM (KCHECK).
009790      GO TO 220-INCREMENT-J.
009810 218-NEW-TRUCK.
009830      ADD ONE TO KLAST.
009850      MOVE BASE-NR TO TRUCK-NUM (KLAST).
009870      MOVE CAPAC (J) TO TRUCK-CAPAC (KLAST).
009890      MOVE TIME-LIM (J) TO TRUCK-TIME-LIM (KLAST).
009892      IF V-USE (J) EQUALS "*"
009894        MOVE "10" TO TRUCK-CAPAC (KLAST)
009896          MOVE "*" TO TRK-USE (KLAST)
009898            ELSE MOVE SPACE TO TRK-USE (KLAST).
009910 220-INCREMENT-J.
009930      ADD ONE TO   J.
009950      ADD 1 TO J-DSP.
009970      IF J GREATER THAN 12
009990        MOVE TRANS-CAPAC TO MAX-CAPAC
010010        MOVE "TR" TO TRUCK-TYPE.
010030      IF J GREATER THAN 18
010050        MOVE TRAILER-CAPAC TO MAX-CAPAC
010070        MOVE "TT" TO TRUCK-TYPE.
010090      IF J GREATER THAN 30 GO TO 230-LAST-TRUCK.
010110      GO TO 210-NEXT-TRUCK.
010130 230-LAST-TRUCK.
010150      MOVE TRUCK-TYPE TO LAST-TYPE.
010170      MOVE SECOND-DIG TO LAST-NUMB.
010190      MOVE 191 TO SQFILE-RECORD-SIZE.
010210      MOVE 17 TO SQFILE-ROW.
010230 250-WRITE.
010250      COPY SQWRIT REPLACING SQWRIT001 BY SQFILE-PREFIX
010270          SQWRIT002 BY FRAME-2-OUTPUT.
010290      MOVE SPACES TO FRAME-2-OUTPUT.
010310      GO TO 040-READ.
010330 300-FRAME-3.
010350      MOVE ONE TO K.
010370      IF I-DATE NOT NUMERIC
010390        MOVE "DATE" TO INPUT-ERROR (K)
010410          MOVE "NOT NUMERIC" TO EXPLANATION-3 (K)
010430      ADD ONE TO K.
010450      IF START-TIME NOT NUMERIC
010470        MOVE "TIME" TO INPUT-ERROR (K)
010490        MOVE "NOT NUMERIC" TO EXPLANATION-3 (K)
010510        ADD ONE TO K.
010530      IF MAX-ROUTE EQUALS SPACES MOVE "2400" TO MAX-ROUTE.
010550        IF MAX-ROUTE NOT NUMERIC
010570        MOVE "MXRT" TO INPUT-ERROR (K)
010590          MOVE "NOT NUMERIC" TO EXPLANATION-3 (K)
010610            ADD ONE TO K.
010630      IF K EQUALS ONE MOVE I-DATE TO O-DATE
010650      MOVE START-TIME TO O-SHIFT
010670      MOVE OPTION TO O-OPT
010690      MOVE MAX-ROUTE TO C-ALL-LIM
010710      MOVE "NO ERRORS" TO EXPLANATION-3 (K).
010730      MOVE 96 TO SQFILE-RECORD-SIZE.
010750      MOVE 11 TO SQFILE-ROW.
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010770 350-WRITE.
010790     COPY SQWRIT REPLACING SQWRIT001 BY SQFILE-PREFIX
010810         SQWRIT002 BY FRAME-3-OUTPUT.
010830     MOVE SPACES TO FRAME-3-OUTPUT.
010850     GO TO 040-READ.
010870 600-EMERGENCY-INPUT.
010890     MOVE "E" TO EMER-CHECK.
010910     MOVE "0" TO M-OPTS.
010930     IF M-OPTION EQUALS "Y"
010950     MOVE "1" TO M-OPTS.
010970     MOVE "0" TO P-OPTS.
010990     IF P-OPTION EQUALS "Y"
011010     MOVE "1" TO P-OPTS.
011030     MOVE P-OPTS TO OUT-OPTION.
011050     MOVE M-OPTS TO OUT-MIX.
011070     MOVE 96 TO SQFILE-RECORD-SIZE.
011090     MOVE 11 TO SQFILE-ROW.
011110 650-WRITE.
011130     COPY SQWRIT REPLACING SQWRIT001 BY SQFILE-PREFIX
011150         SQWRIT002 BY FRAME-6-OUTPUT.
011170     MOVE SPACES TO FRAME-6-OUTPUT.
011190     GO TO 040-READ.
011210 700-HISTORY.
011230     MOVE "H" TO HIST-CHECK
011250     MOVE FCN-TYPE TO FCN
011270     MOVE ZEROES TO ERR-CNT.
011290     IF FCN-TYPE EQUALS "2" GO TO 750-FUNCTION-2.
011291     IF FCN-TYPE EQUALS "1"
011292     MOVE ZEROS TO START-DATE
011293     MOVE ZEROS TO END-DATE
011294     MOVE ZEROS TO H-SHIFT.
011310     IF START-DATE NOT NUMERIC
011330      ADD ONE TO ERR-CNT
011370       TO EXPLANATION-> (ERR-CNT)
011390       MOVE ERR-CNT TO INPUT-ERR (ERR-CNT).
011410     IF END-DATE NOT NUMERIC
011430       ADD ONE TO ERR-CNT
011450       MOVE "END DATE NOT NUMERIC"
011490       MOVE ERR-CNT TO INPUT-ERR (ERR-CNT).
011491     IF START-DATE NOT= END-DATE
011492     MOVE ZERO TO H-SHIFT.
011510     IF H-SHIFT NOT NUMERIC
011530       ADD ONE TO ERR-CNT
011550       MOVE "SHIFT NOT NUMERIC"
011570       TO EXPLANATION-> (ERR-CNT)
011590       MOVE ERR-CNT TO INPUT-ERR (ERR-CNT)
011610     GO TO 799-DISPLAY-ERRORS.
011630     MOVE START-DATE TO DATE1
011650     MOVE END-DATE TO DATE2
011670     MOVE H-SHIFT TO SHIFT-ALL.
011690     IF H-OPTION EQUALS "Y"
011710       MOVE "1" TO OPTION-H ELSE
011730       MOVE "0" TO OPTION-H.
011750     GO TO 799-DISPLAY-ERRORS.
011770 750-FUNCTION-2.
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011790      MOVE ZEROES TO JJ
011810      MOVE ZEROES TO ERR-CNT.
011830      IF TODAY-DATE NOT NUMERIC
011850        ADD ONE TO ERR-CNT
011870        MOVE "DATE NOT NUMERIC" TO EXPLANATION-4 (ERR-CNT)
011890        MOVE ERR-CNT TO INPUT-ERR (ERR-CNT).
011910      IF TODAY-SHIFT NOT NUMERIC
011930        ADD ONE TO ERR-CNT
011950        MOVE "SHIFT NOT NUMERIC" TO EXPLANATION-4 (ERR-CNT)
011970        MOVE ERR-CNT TO  INPUT-ERR (ERR-CNT).
011990      IF ERR-CNT GREATER THAN ZERO GO TO 799-DISPLAY-ERRORS.
012010      MOVE TODAY-DATE TO DATE-SAVE
012030      MOVE TODAY-SHIFT TO SHIFT-SAVE.
012050 760-INCREMENT.
012055      IF LLAST EQUALS 6 GO TO 799-DISPLAY-ERRORS.
012070      ADD ONE TO JJ.
012090      IF JJ GREATER THAN 6
012110        GO TO 799-DISPLAY-ERRORS.
012115      IF ORIGH(JJ) EQUALS SPACES GO TO 799-DISPLAY-ERRORS.
012130      MOVE ORIGH (JJ) TO TEST-NAME.
012150      PERFORM 500-NAME-TEST.
012170      IF TEST-NAME NOT EQUAL  ORIGH (JJ)
012190        ADD ONE TO ERR-CNT
012210        MOVE "ORIGIN MISMATCH" TO EXPLANATION-4 (ERR-CNT)
012230        MOVE JJ TO INPUT-ERR (ERR-CNT).
012250      IF ERR-CNT EQUALS 6 GO TO 799-DISPLAY-ERRORS.
012270      MOVE DESTH (JJ) TO TEST-NAME.
012290      PERFORM 500-NAME-TEST.
012310      IF TEST-NAME NOT EQUAL  DESTH (JJ)
012330        ADD ONE TO ERR-CNT
012350        MOVE "DEST MISMATCH" TO EXPLANATION-4 (ERR-CNT)
012370        MOVE JJ TO INPUT-ERR (ERR-CNT).
012390      IF ERR-CNT EQUALS 6 GO TO 799-DISPLAY-ERRORS.
012410      IF SIZEH (JJ) NOT NUMERIC
012430        ADD ONE TO ERR-CNT
012450        MOVE "SIZE NOT NUMERIC" TO EXPLANATION-4 (ERR-CNT)
012470        MOVE JJ TO INPUT-ERR (ERR-CNT).
012490      IF ERR-CNT EQUALS 6 GO TO 799-DISPLAY-ERRORS.
012510      IF ERR-CNT GREATER THAN ZERO
012530        GO TO 760-INCREMENT.
012550      ADD ONE TO LLAST.
012570      MOVE ORIGH (JJ) TO ORIGS (LLAST)
012590        MOVE DESTH (JJ) TO DESTS (LLAST)
012610        MOVE SIZEH (JJ) TO SIZES (LLAST)
012630        MOVE VEHH (JJ) TO VEHS (LLAST).
012650      IF EMERH (JJ) EQUALS "Y"
012670        MOVE "1" TO EMERS (LLAST) ELSE
012690        MOVE "0" TO EMERS (LLAST).
012710      IF RPLEH (JJ) EQUALS "Y"
012730        MOVE "1" TO RPLES (LLAST) ELSE
012750        MOVE "0" TO RPLES (LLAST).
012770      GO TO 760-INCREMENT.
012790 799-DISPLAY-ERRORS.
012810      IF ERR-CNT EQUALS ZEROES
012830        MOVE "NO ERRORS" TO EXPLANATION-4 (1)
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012850       MOVE ZEROES TO INPUT-ERR (1).
012870     MOVE 226 TO SQFILE-RECORD-SIZE.
012890     MOVE 16 TO SQFILE-ROW.
012910 799-WRITE.
012930     COPY SQWRIT REPLACING SQWRIT001 BY SQFILE-PREFIX
012950       SQWRIT002 BY FRAME-7-OUTPUT.
012970     MOVE SPACES TO FRAME-7-OUTPUT.
012990     GO TO 040-READ.
013010 400-OUTPUT.
013030     IF HIST-CHECK EQUALS "H" GO TO 400-HISTORY-CARDS.
013050     IF EMER-CHECK NOT EQUAL "E" GO TO 400-OUTPUT-REGULAR.
013070     OPEN OUTPUT VS2IN.
013090     MOVE ONE TO J.
013110 410-ORDER-OUTPUT-E.
013130     MOVE O-SHIFT TO O-TIME.
013150     MOVE OUT-SIZE (J) TO O-SIZ.
013170     MOVE OUT-ORIG (J) TO O-ORIGN.
013190     MOVE OUT-DEST (J) TO O-DESTN.
013210     MOVE ORDER-CARD-E TO CARD-IMAGE.
013230     WRITE CARD-IMAGE.
013250     ADD ONE TO J.
013270     IF J GREATER THAN JLAST NEXT SENTENCE
013290       ELSE GO TO 410-ORDER-OUTPUT-E.
013310     MOVE END-CARD TO CARD-IMAGE.
013330     WRITE CARD-IMAGE.
013350     MOVE M-OPTS TO O-MIX.
013370     MOVE P-OPTS TO PROFT.
013390     MOVE OPT-CARD-E TO CARD-IMAGE.
013410     WRITE CARD-IMAGE.
013430     MOVE ZERO TO O-NUME-STS.
013450     MOVE ZERO TO O-NUMB-TRS.
013470     MOVE ZERO TO O-NUMB-TTS.
013490     IF SAME-REG EQUALS "S"
013510       MOVE "A" TO O-NUMB-STS.
013530     MOVE TRUCK-HEADER-CARD TO CARD-IMAGE.
013550     WRITE CARD-IMAGE.
013570     IF SAME-REG EQUALS "S"
013590       GO TO 421-END-CARD.
013610     MOVE ONE TO J.
013630 420-TRUCK-OUTPUT-E.
013635     MOVE TRK-USE (J) TO TRK-USE-IT
013650     MOVE TRUCK-NUM (J) TO O-TRUCK-CODE.
013670     MOVE TRUCK-TIME-LIM (J) TO O-TRUCK-TIME.
013690     MOVE SPACES TO O-TRUCK-CAPAC.
013710     MOVE TRUCK-CARD TO CARD-IMAGE.
 013730      WRITE CARD-IMAGE.
013750     ADD ONE TO J.
013770     IF J GREATER THAN KLAST GO TO 421-END-CARD
013790       ELSE GO TO 420-TRUCK-OUTPUT-E.
       421-END-CARD.
013870     CLOSE VS2IN WITH RELEASE.
013890     ZIP AVS2-EXECUTE.
013910     GO TO 040-READ.
013930 400-OUTPUT-REGULAR.
           OPEN OUTPUT VS2IN.
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                MOVE DATE-CARD TC CARD-IMAGE.
                WRITE CARD-IMAGE.
                MOVE SHIFT-CARD TO CARD-IMAGE.
                WRITE CARD-IMAGE.
                MOVE OPT-CARD TO CARD-IMAGE.
                WRITE CARD-IMAGE.
014090          MOVE ONE TO J.
014110 410-ORDER-OUTPUT.
014130          MOVE OUT-SIZE (J) TO O-OSIZE.
014150          MOVE OUT-ORIG (J) TC O-ORIGIN.
014170          MOVE OUT-DEST (J) TO O-DESTIN.
                MOVE ORDER-CARD TO CARD-IMAGE.
                WRITE CARD-IMAGE.
014230          ADD ONE TO J.
014250          IF J GREATER THAN JLAST NEXT SENTENCE
014270            ELSE GO TO 410-ORDER-OUTPUT.
                MOVE END-CARD TO CARD-IMAGE.
                WRITE CARD-IMAGE.
014330          MOVE ZEROES TO O-NUMB-STS-R
014350          MOVE ZEROES TO O-NUMB-TRS-R
014370          MOVE ZEROES TO O-NUMB-TTS-R
014390          MOVE O-ALL-LIM TO O-ALL-LIM-R.
                MOVE TRUCK-HEADER-CARD-R TO CARD-IMAGE.
                WRITE CARD-IMAGE.
014450          MOVE ONE TO J.
014470 420-TRUCK-OUTPUT.
014490          MOVE TRK-USE (J) TO TRK-USE-IT.
014490          MOVE TRUCK-NUM (J) TC O-TRUCK-CODE.
014510          MOVE TRUCK-TIME-LIM (J) TO O-TRUCK-TIME.
014530          MOVE TRUCK-CAPAC (J) TO O-TRUCK-CAPAC.
                MOVE TRUCK-CARD TO CARD-IMAGE.
                WRITE CARD-IMAGE.
014590          ADD ONE TO J.
014610          IF J GREATER THAN KLAST NEXT SENTENCE
014630            ELSE GO TO 420-TRUCK-OUTPUT.
                CLOSE VS2IN WITH RELEASE.
                ZIP AVS2-EXECUTE.
014730          GO TO 040-READ.
014750 400-HISTORY-CARDS.
014770          OPEN OUTPUT VS3IN.
014790          MOVE FCN-ALL-CARD TO CARD-IMAGE2.
014810          WRITE CARD-IMAGE2.
014830          IF FCN NOT EQUAL "2"
014850            GO TO 410-RUN-AVS3.
014870          MOVE ZEROES TO JJ.
014890 405-INCREMENT.
014910          ADD ONE TO JJ.
014930          IF JJ GREATER THAN LLAST
014950            GO TO 410-RUN-AVS3.
014970          MOVE ORIGS (JJ) TO ORIG-SAVE
014990            MOVE DESTS (JJ) TO DEST-SAVE
015010          MOVE SIZES (JJ) TO SIZE-SAVE
015030            MOVE EMERS (JJ) TC EMERG-SAVE
015050            MOVE RPLES (JJ) TO RPLE-SAVE.
015070          MOVE VEHS (JJ) TC VEH-NO.
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015090      MOVE FCN-2-CARD TO CARD-IMAGE2.
015110      WRITE CARD-IMAGE2.
015130      GO TO 405-INCREMENT.
015150 410-RUN-AVS3.
015170      CLOSE VS3IN WITH RELEASE.
015190      ZIP AVS3-EXECUTE.
015210      GO TO 040-READ.
015230 500-NAME-TEST SECTION.
015250 510-START.
015270      MOVE ONE TO M.
015290 520-LIST-LOOP.
015310      IF TEST-NAME EQUALS W-NAME (M) GO TO 530-EXIT.
015330      ADD ONE TO M.
015350      IF M GREATER THAN 82 ,
015370        MOVE SPACES TO TEST-NAME.
015390      GO TO 530-EXIT.
015410      GO TO 520-LIST-LOOP.
015430 530-EXIT.
015450      EXIT.
015470 599-CLEAR-RESTART SECTION.
015490 599-START.
015510      MOVE SPACE  TO SAME-REG
015530        MOVE SPACE TO EMER-CHECK.
015550      MOVE SPACE TO HIST-CHECK.
015570      MOVE ONE TO J.
015590      MOVE ONE TO K.
015591      MOVE ONE TO JJ.
015592 598-LOOP.
015593      MOVE SPACES TO ORIGS(JJ)
015594      MOVE SPACES TO DESTS(JJ)
015595      MOVE SPACES TO SIZES(JJ)
015596      MOVE SPACES TO EMERS(JJ)
015597      MOVE SPACES TO RPLES(JJ)
015598      MOVE SPACES TO VEHS(JJ).
015599      ADD ONE TO JJ.
015600      IF JJ GREATER THAN 6 GO TO 599-LOOP ELSE GO TO 598-LOOP.
015610 599-LOOP.
015630      IF ORDER-OUTPUT (J) NOT EQUAL SPACES
015650        MOVE SPACES TO ORDER-OUTPUT (J).
015670      ADD ONE TO J.
015690      IF J GREATER THAN 99 GO TO 031-INITIALIZE.
015710      IF K GREATER THAN 50 GO TO 599-LOOP.
015730      IF TRUCK-OUTPUT (K) NOT EQUAL SPACES
015750        MOVE SPACES TO TRUCK-OUTPUT (K).
015770      ADD ONE TO K.
015790      GO TO 599-LOOP.
015810 CLOSE-FILE SECTION 54.
015830 05-CLOSE-IN.
015850      COPY SQCLIN.
015870 06-SQCLIN.
015890 06-CLOSE-OUT.
015910      GO TO I-EOJ.
015930 OPEN-SUBR SECTION 51.
015950 07-OPEN-SUBR.
015970      COPY IOPENR.
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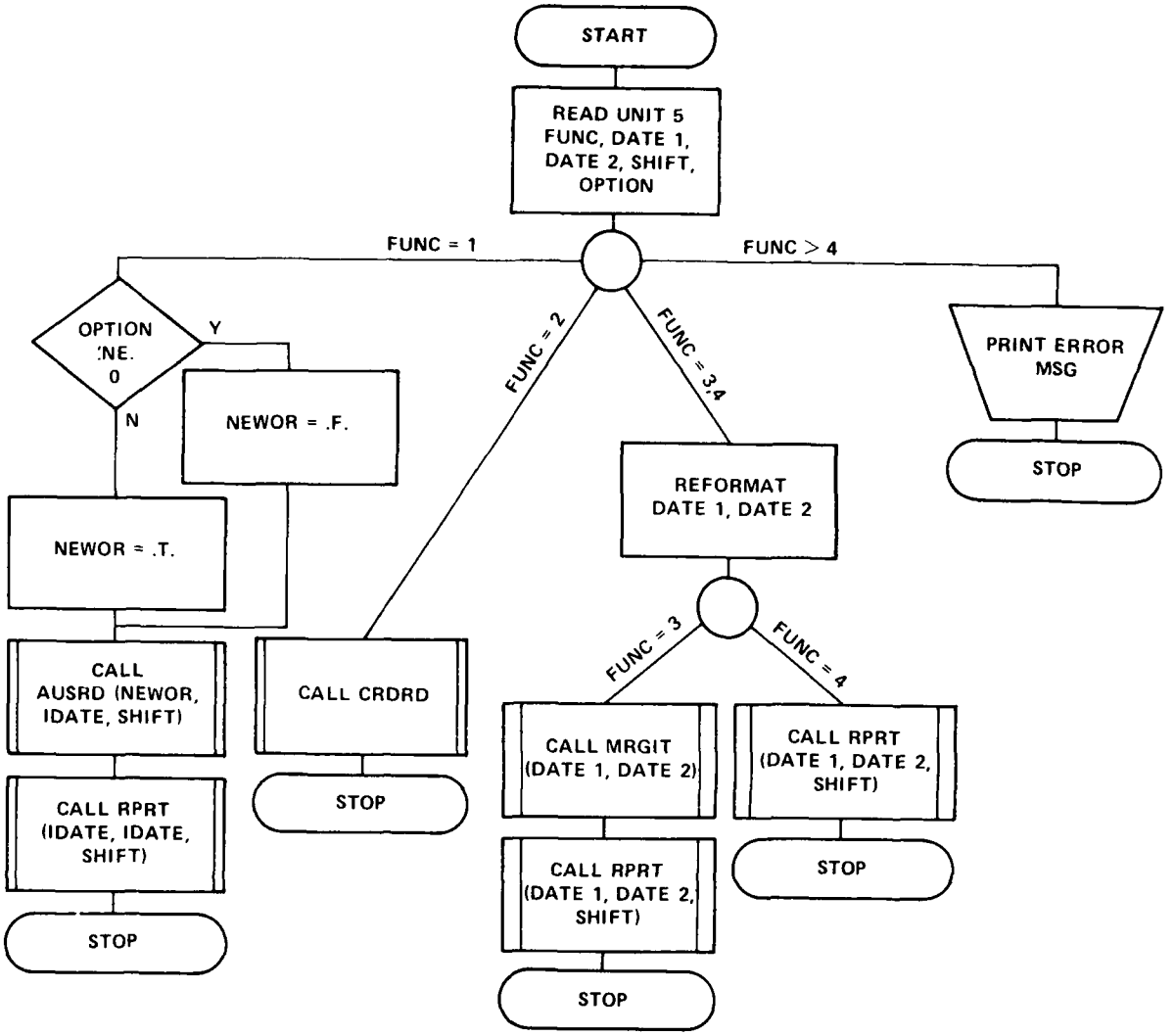
015990 BASE-SUBR SECTION.
016010 08-READ-SUBR.
016030     COPY SQRED1 REPLACING SQRED1002 BY 05-CLOSE-IN.
016050 09-WRITE-SUBR.
016070     COPY SQOUT1 REPLACING SQOUT1002 BY 16-OUTPUT-ERROR.
016090 SDCH-SUBR SECTION 52.
016110 10-DCH-INPUT.
016130     COPY SQRED2.
016150 11-DCH-OUTPUT.
016170     COPY SQOUT2.
016190 DUMMY-PARA SECTION.
016210 SQRED3.
016230 SQOUT3.
016250 CLOSE-SUBR SECTION 54.
016270 15-CLOSE-SUBR.
016290     COPY ICLOSR.
016310 ERR-PROC SECTION 59.
016330 16-OUTPUT-ERROR.
016350     MOVE "OUTPUT ERROR" TO I-ABORT-MSG.
016370     TRACE 20.
016390     GO TO I-ABORT.
016410 COMMON-SUBR SECTION 99.
016430 17-COMMON-SUBR.
016450     COPY ICOMON.
016470 END-OF-JOB.
```

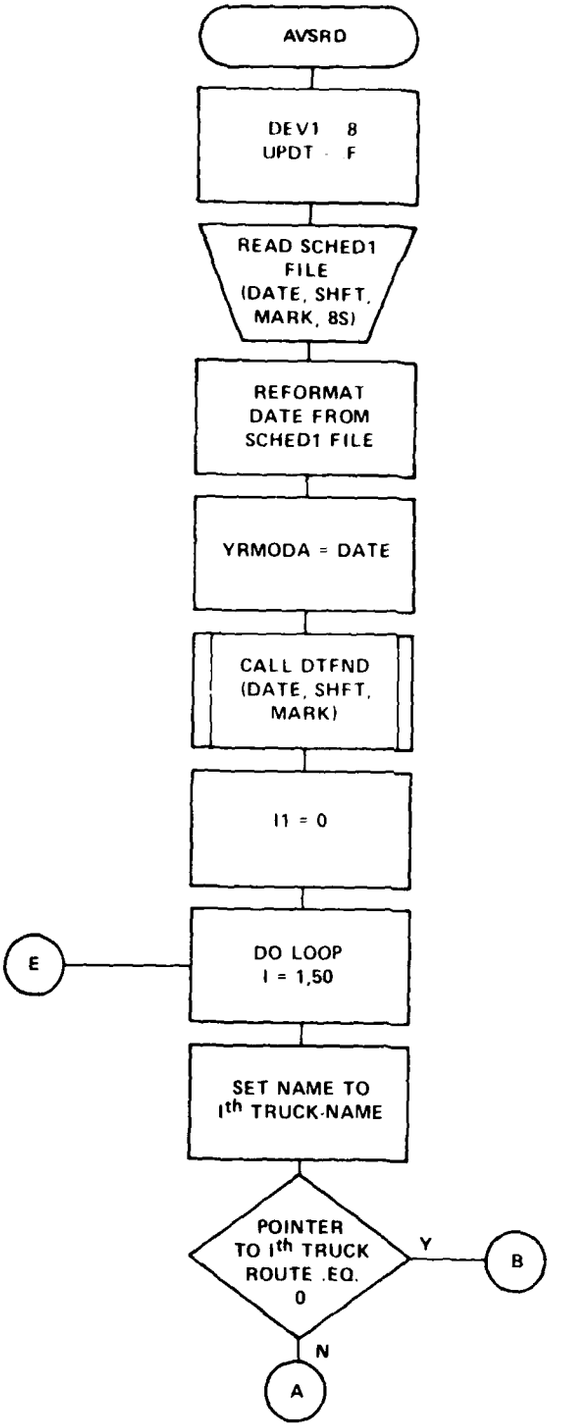
APPENDIX D - AVS 3, HISTORY/UPDATE, FLOWCHARTS AND LISTINGS

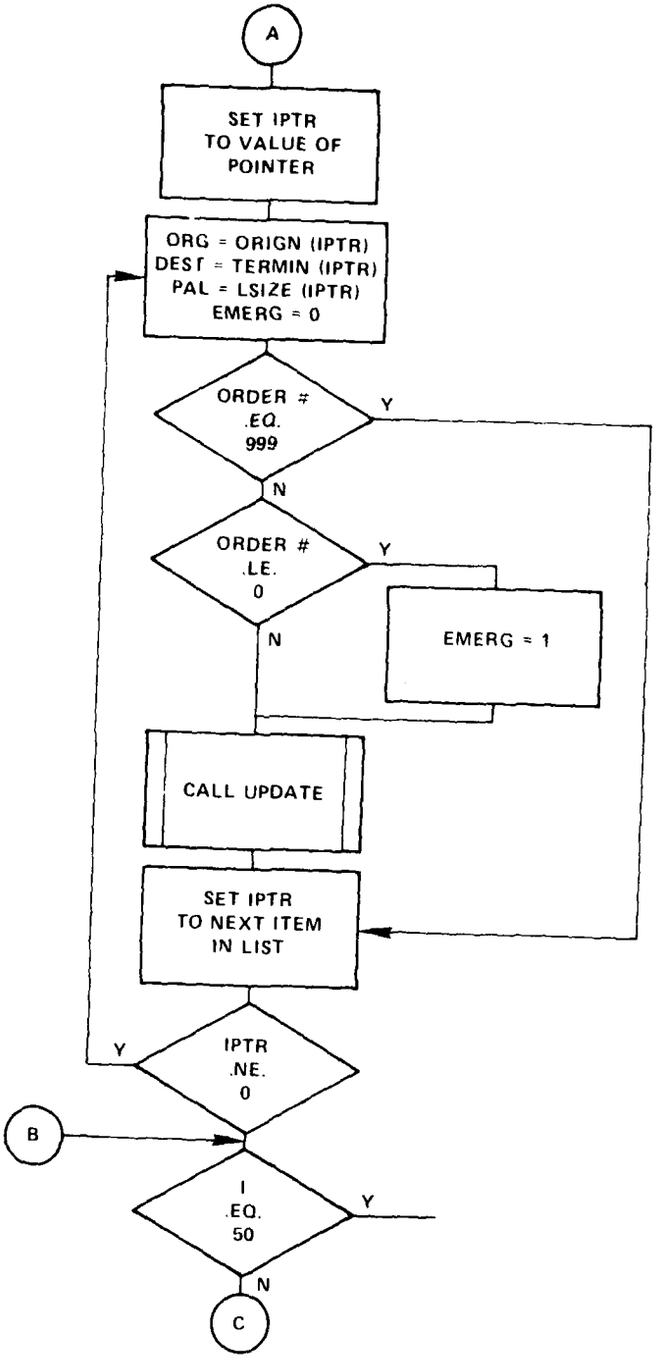
MAIN PROGRAM

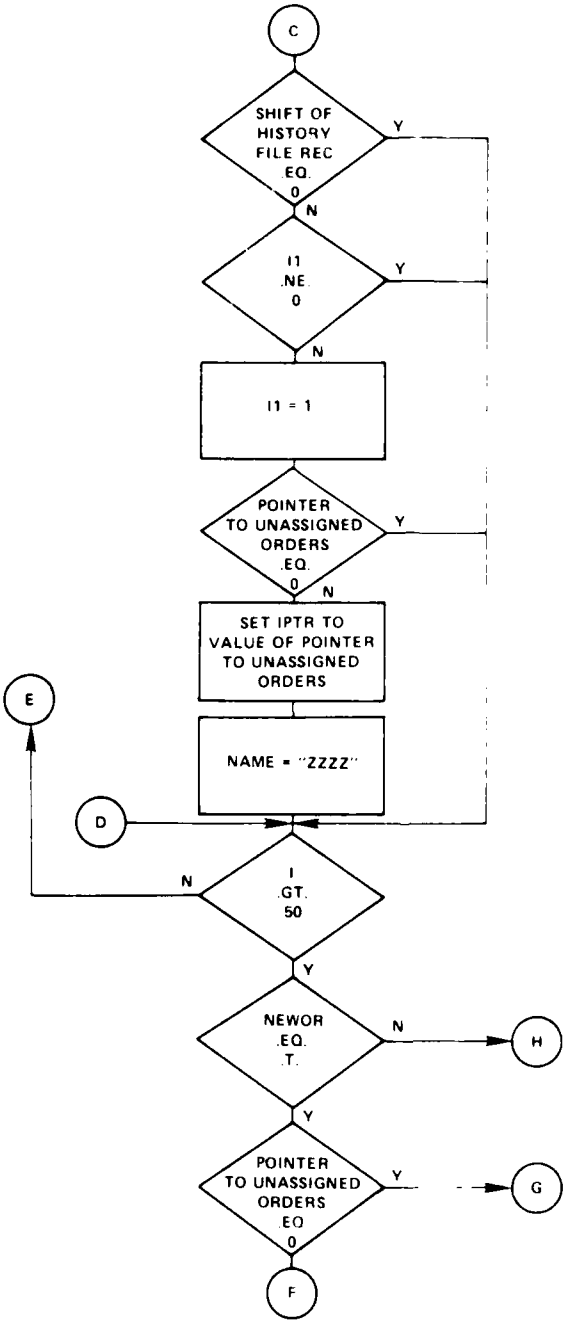


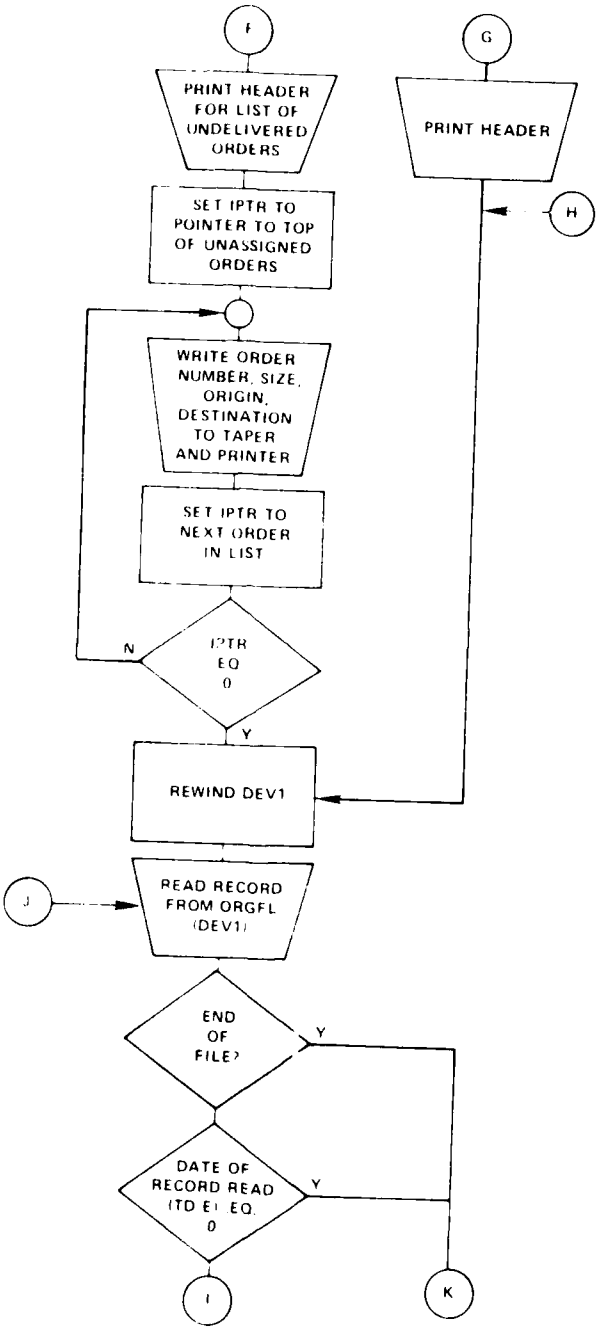
```
      PROGRAM START.     7.7/74   OPT=0 ROUND=*/ TRACE          FTN 4.6+460        10/15/80  12.23.05

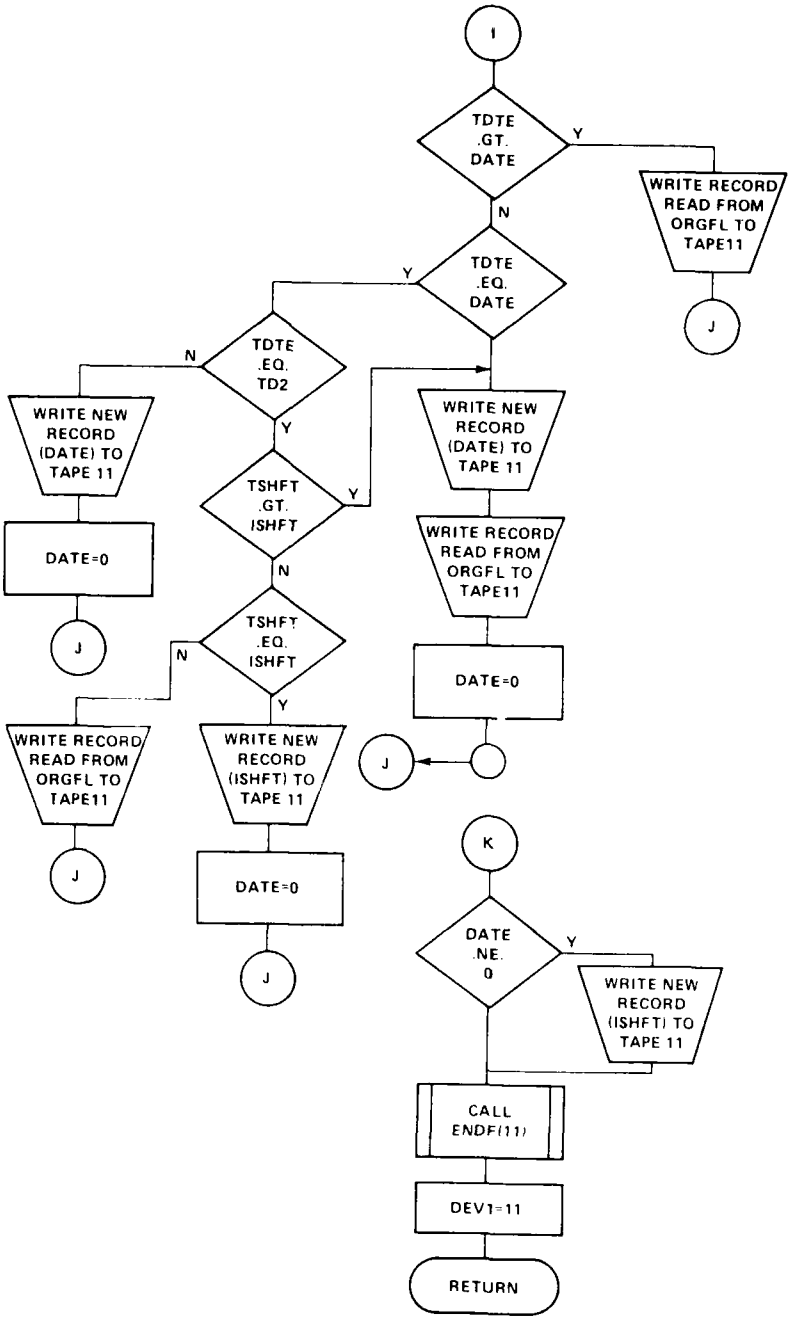
 1          IDENT AVS3                                                              AVS3        2
            SIZE  INTEGER=7                                                         AVS3        3
            SEGMENT AVSRD,MRGIT,MERGE,CRDRD,RPLCE,DTFND,RPRT,OMFIT                  AVS3        4
            FILE  7=SCHED1,UNIT=DISK,BLOCKING=1,RECORD=80                           AVS3        5
 9          FILE  8=ORGFL,UNIT=DISK,BLOCKING=1,RECORD=1424                          AVS3        6
            FILE  9=TEMP,UNIT=DISK,BLOCKING=1,RECORD=1424                           AVS3        7
            FILE  11=PERMFLE,UNIT=DISK,BLOCKING=1,RECORD=1424,BLOCK                 AVS3        8
            FILE  12=AVIN,UNIT=DISK,BLOCKING=1,RECORD=80                            AVS3        9
            FILE  5=VS3IN,UNIT=DISK,BLOCKING=1,RECORD=80                            AVS3       10
15          REAL SHIFT                                                              AVS3       11
            INTEGER DEV2                                                            AVS3       12
            LOGICAL UPDT,UPDTE                                                      AVS3       13
            INTEGER DATE1,DATE2,FUNC,OPTION,DARRY(10),DEV1                          AVS3       14
            LOGICAL NEWOR                                                           AVS3       15
19          COMMON/CNTRL/UPDT,CARRY,DEV1,DEV2,UPDTE                                 AVS3       16
            READ(5,1000)FUNC,DATE1,DATE2,INSHF,OPTION                               AVS3       17
         1000 FORMAT(I1,2I6,I4,I1)                                                  AVS3       18
            SHIFT=FLOAT(INSHF)                                                      AVS3       19
            GOTO (10,20,30,30,5,5,5,5,60),FUNC                                      AVS3       20
25       5  PRINT 1100                                                             AVS3       21
         1100 FORMAT(" INVALID OPTION-PROGRAM TERMINATED")                          AVS3       22
            STOP                                                                    AVS3       23
         10 NEWOR=.F.                                                               AVS3       24
            IF(OPTION.NE.0) NEWOR=.T.                                               AVS3       25
29          CALL AVSRD(NEWOR,IDATE,SHIFT)                                           AVS3       26
            CALL RPRT(IDATE,IDATE,SHIFT)                                            AVS3       27
            STOP                                                                    AVS3       28
         20 CALL CNTRD                                                              AVS3       29
            STOP                                                                    AVS3       30
35       30 IDATE=DATE1/100                                                         AVS3       31
            IYR=MOD(DATE1,100)                                                      AVS3       32
            FIYR=FLOAT(IYR)                                                         AVS3       33
            FDATE=FLOAT(IDATE)                                                      AVS3       34
            FDTE1=FDATE*10000.+FIYR                                                 AVS3       35
39          DATE1=IFIX(FDTE1)                                                       AVS3       36
            IDATE=DATE2/100                                                         AVS3       37
            IYR=MOD(DATE2,100)                                                      AVS3       38
            FIYR=FLOAT(IYR)                                                         AVS3       39
            FDATE=FLOAT(IDATE)                                                      AVS3       40
44          FDTE1=FDATE*10000.+FIYR                                                 AVS3       41
            DATE2=IFIX(FDTE1)                                                       AVS3       42
            IF(DATE2.EQ.0)DATE2=DATE1                                               AVS3       43
            GOTO(40,40,40,50) ,FUNC                                                 AVS3       44
         40 CALL MRGIT(DATE1,DATE2)                                                 AVS3       45
49          SHIFT=0.                                                                AVS3       46
            CALL RPRT(DATE1,DATE2,SHIFT)                                            AVS3       47
            STOP                                                                    AVS3       48
         50 DEV1=8                                                                  AVS3       49
            CALL RPRT(DATE1,DATE2,SHIFT)                                            AVS3       50
54          STOP                                                                    AVS3       51
         60 IF(.NOT.(DATE1.EQ.999999.AND.DATE2.EQ.999999))STOP                      AVS3       52
            CALL ENDF(11)                                                           AVS3       53
            PRINT 1200                                                              AVS3       54
         1200 FORMAT(" FILE DELETED")                                               AVS3       55
59          END                                                                     AVS3       56
```


AVSRD
DEV1 8
UPDT F
READ SCHED1 FILE (DATE, SHFT, MARK, 8S)
REFORMAT DATE FROM SCHED1 FILE
YRMODA = DATE
CALL DTFND (DATE, SHFT, MARK)
I1 = 0
E
DO LOOP I = 1,50
SET NAME TO Ith TRUCK-NAME
POINTER TO Ith TRUCK ROUTE .EQ. 0
Y
B
N
A


A
SET IPTR
TO VALUE OF
POINTER
ORG = ORIGN (IPTR)
DEST = TERMIN (IPTR)
PAL = LSIZE (IPTR)
EMERG = 0
ORDER #
.EQ.
999
Y
N
ORDER #
.LE.
0
Y
N
EMERG = 1
CALL UPDATE
SET IPTR
TO NEXT ITEM
IN LIST
IPTR
.NE.
0
Y
B
I
.EQ.
50
Y
N
C


C
SHIFT OF HISTORY FILE REC .EQ. 0
Y
N
I1 .NE. 0
Y
N
I1 = 1
POINTER TO UNASSIGNED ORDERS .EQ. 0
Y
N
SET IPTR TO VALUE OF POINTER TO UNASSIGNED ORDERS
NAME = "ZZZZ"
E
D
I .GT. 50
N
Y
NEWOR .EQ. .T.
N
H
Y
POINTER TO UNASSIGNED ORDERS EQ 0
Y
G
F


F
G
PRINT HEADER FOR LIST OF UNDELIVERED ORDERS
PRINT HEADER
H
SET IPTR TO POINTER TO TOP OF UNASSIGNED ORDERS
WRITE ORDER NUMBER, SIZE, ORIGIN, DESTINATION TO TAPER AND PRINTER
SET IPTR TO NEXT ORDER IN LIST
IPTR EQ 0
N
Y
REWIND DEV1
J
READ RECORD FROM ORGFL (DEV1)
END OF FILE?
Y
DATE OF RECORD READ (TD E) EQ. 0
Y
I
K


I
TDTE .GT. DATE
Y
WRITE RECORD READ FROM ORGFL TO TAPE11
J
N
TDTE .EQ. DATE
Y
N
TDTE .EQ. TD2
WRITE NEW RECORD (DATE) TO TAPE 11
DATE=0
J
Y
TSHFT .GT. ISHFT
Y
N
TSHFT .EQ. ISHFT
N
WRITE RECORD READ FROM ORGFL TO TAPE11
J
Y
WRITE NEW RECORD (ISHFT) TO TAPE 11
DATE=0
J
WRITE NEW RECORD (DATE) TO TAPE 11
WRITE RECORD READ FROM ORGFL TO TAPE11
DATE=0
J
K
DATE .NE. 0
Y
WRITE NEW RECORD (ISHFT) TO TAPE 11
CALL ENDF(11)
DEV1=11
RETURN

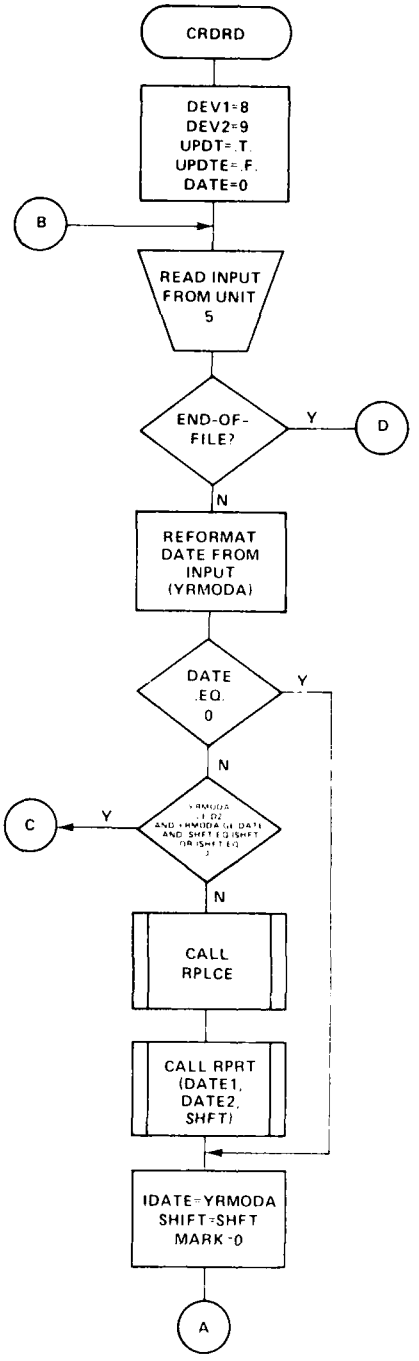
```
SUBROUTINE AVSRD      74/74   OPT=0 ROUND=*/ TRACE          FTN 4.6+460      10/15/80  12.23.05

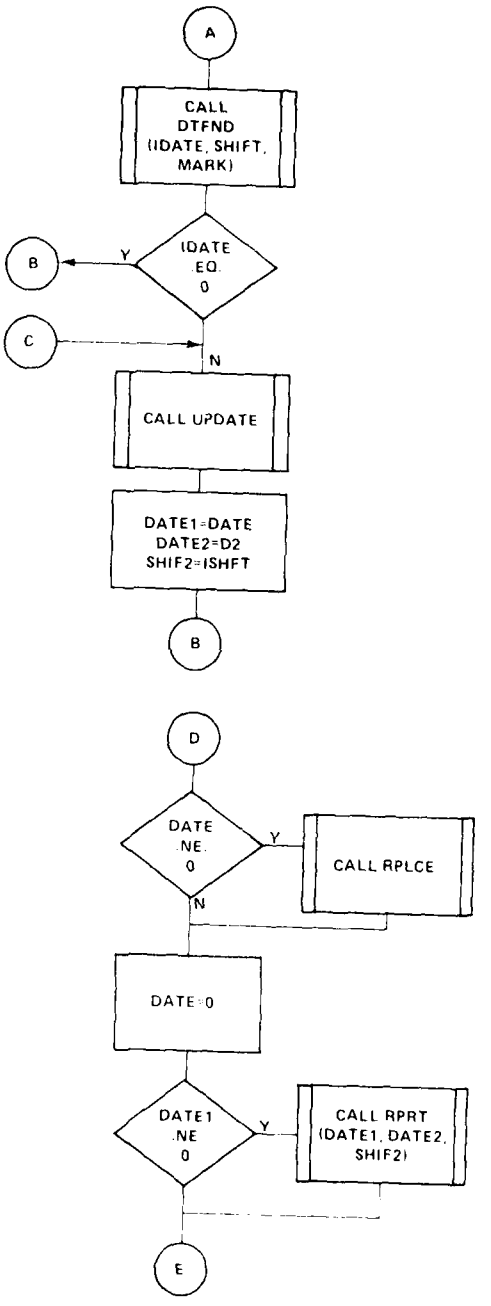
 1                                                                                    AVS3      57
                SUBROUTINE AVSRD(NEWOR,IDATE,SHIFT)                                  AVS3      58
              C ALPHANUMERICS                                                        AVS3      59
                ALPHA JUNK1                                                          AVS3      60
 5              ALPHA ORIGN(200),TERMN(200),TNAME(50)                                AVS3      61
               * ,WHNAM(92)                                                          AVS3      62
              C BINARY                                                               AVS3      63
                INTEGER CNUMB(200),PTSOR(50),LFRWD(200),LSIZE(200),PSPUL(3)          AVS3      64
              C ALPHA NUMERICS                                                       AVS3      65
10              ALPHA NAME,TRK,ORG,DEST,TINME(50),TORIG(50),TDSTN(50),INAME(50),     AVS3      66
               1 ORIG(50),DSTN(50)                                                   AVS3      67
              C BINARY                                                               AVS3      68
                INTEGER YRMODA,PAL,EMERG,TDTE,TREGP(50),TEPAL(50),DATE,              AVS3      69
               1REGP(50),EPAL(50)                                                    AVS3      70
15              LOGICAL UPDTE                                                        AVS3      71
                INTEGER IMARK,TMARK,MARK,D2,TD2                                      AVS3      72
                REAL SHFT,ISHFT,TSHFT                                                AVS3      73
                INTEGER DARRY(10),DEV1,DEV2                                          AVS3      74
                LOGICAL NEWOR,UPDT                                                   AVS3      75
20              EXTERNAL DTFND,MERGE                                                 AVS3      76
                COMMON/AVSRC1/YRMODA,PAL,EMERG,IFTN                                  AVS3      77
                COMMON/AVSRC2/SHFT                                                   AVS3      78
                COMMON/AVSRC3/NAME,TRK,ORG,DEST                                      AVS3      79
                COMMON/TMPRC1/TDTE,TD2,TMARK,TREGP,TEPAL                             AVS3      80
25              COMMON/TMPRC2/TSHFT                                                  AVS3      81
                COMMON/TMPRC3/TINME,TORIG,TDSTN                                      AVS3      82
                COMMON/HISRC1/DATE,D2,IMARK,REGP,EPAL                                AVS3      83
                COMMON/HISRC2/ISHFT                                                  AVS3      84
                COMMON/HISRC3/INAME,ORIG,DSTN                                        AVS3      85
30              COMMON/CNTRL/UPDT,DARRY,DEV1,DEV2,UPDTE                              AVS3      86
                DATA TNAME / 4HST1 , 4HST2 , 4HST3 , 4HST4 , 4HST5 ,                 AVS3      87
               *             4HST6 , 4HST7 , 4HST8 , 4HST9 , 4HST10,                AVS3      88
               *             4HST11, 4HST12, 4HST13, 4HST14, 4HST15,                AVS3      89
               *             4HST16, 4HST17, 4HST18, 4HST19, 4HST20,                AVS3      90
35             *             4HTR1 , 4HTR2 , 4HTR3 , 4HTR4 , 4HTR5 ,                AVS3      91
               *             4HTR6 , 4HTR7 , 4HTR8 , 4HTR9 , 4HTR10 ,               AVS3      92
               *             4HTT1 , 4HTT2 , 4HTT3 , 4HTT4 , 4HTT5 ,                AVS3      93
               *             4HTT6 , 4HTT7 , 4HTT8 , 4HTT9 , 4HTT10,                AVS3      94
               *              4HIT 1,4HIT 2,4HIT 3,4HIT 4,4HIT 5,                   AVS3      95
40             *              4HIT 6,4HIT 7,4HIT 8,4HIT 9,4HIT10 /                  AVS3      96
                DEV1=8                                                               AVS3      97
                UPDT=.F.                                                             AVS3      98
              C READ DATA FROM AVS SHED1                                             AVS3      99
                READ(7,1600) NWARE,(JUNK,I=1,16),(WHNAM(I),I=1,NWARE)                AVS3     100
45       1600 FORMAT(10I8/7I8/(1X,10A6))                                             AVS3     101
                DO 1001 I=1,200                                                      AVS3     102
                READ(7,1000) CNUMB(I),INFO,IDESTP,IAREA,LFRWD(I)                     AVS3     103
       1000 FORMAT(5I8,36X)                                                          AVS3     104
                IF(CNUMB(I).EQ.0) GO TO 1001                                         AVS3     105
50              ICHK=1                                                               AVS3     106
                IF(INFO.GT.0) ICHK=-1                                                AVS3     107
                INFO=IABS(INFO)                                                      AVS3     108
                IPTR=MOD(INFO/100,100)                                               AVS3     109
                TERMN(I)=WHNAM(IPTR)                                                 AVS3     110
55              IPTR=INFO/10000                                                      AVS3     111
                ORIGN(I)=WHNAM(IPTR)                                                 AVS3     112
                LSIZE(I)=MOD(INFO,100)*ICHK                                          AVS3     113
```

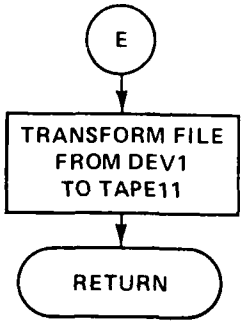
```
      SUBROUTINE AVSRO      74/74   OPT=0 ROUNDD=*/ TRACE          FTN 4.6+460      10/15/80  12.23.05

                  1001 CONTINUE                                                          AVS3      114
                       READ(7,1100) (PTSOR(I),I=1,50)                                    AVS3      115
      60          1100 FORMAT(I8,40X)                                                    AVS3      116
                       READ(7,1750)(FJUNK,I=1,141)                                       AVS3      117
                  1750 FORMAT(3F6.1)                                                     AVS3      118
                       READ(7,1800) (JUNK,I=1,10)                                        AVS3      119
                  1800 FORMAT(4X8/4I8/2I8)                                               AVS3      120
      65               READ(7,1300) SHFT,IDATE                                           AVS3      121
                  1300 FORMAT(F6.1,I8)                                                   AVS3      122
                       READ(7,1400) MARK                                                 AVS3      123
                  1400 FORMAT(I6)                                                        AVS3      124
                  C ORGANIZE DATA IN FORMAT DATE,TRUCKNAME,ORIGIN,DESTINATION,LOGSIZE    AVS3      125
      70          C EMERGENCY(=1 EMERGENCY,=0 REGULAR)                                   AVS3      126
                       IYR=MOD(IDATE,100)                                                AVS3      127
                       IDATE2=IDATE/100                                                  AVS3      128
                       FIYR=FLOAT(IYR)                                                   AVS3      129
                       FDATE=FLOAT(IDATE2)                                               AVS3      130
      75               FDTE2=FDATE*10000.+FIYR                                           AVS3      131
                       IDATE=IFIX(FDTE2)                                                 AVS3      132
                       YRMODA=IDATE                                                      AVS3      133
                       CALL DTEND(IDATE,SHFT,MARK)                                       AVS3      134
                       DO 200 I=1,50                                                     AVS3      135
      80               NAME=TNAME(I)                                                     AVS3      136
                       IF(PTSOR(I).EQ.0) GO TO 200                                       AVS3      137
                  C GET FIRST ELEMENT IN CHAIN                                           AVS3      138
                       IPTR=PTSOR(I)                                                     AVS3      139
                   20  ORG=ORIGN(IPTR)                                                   AVS3      140
      85               DEST=TERMN(IPTR)                                                  AVS3      141
                       PAL=LSIZE(IPTR)                                                   AVS3      142
                       EMERG=0                                                           AVS3      143
                       IF(ONUMB(IPTR).EQ.999)GOTO 185                                    AVS3      144
                       IF(ONUMB(IPTR).LE.0) EMERG=1                                      AVS3      145
      90          C CALL UPDATING ROUTINE-VARIABLES PASSED THROUGH AVSRC(IN COMMON)       AVS3      146
                       CALL UPDATE                                                       AVS3      147
                   185 IPTR=LFRWD(IPTR)                                                  AVS3      148
                       IF(IPTR.NE.0) GOTO 20                                             AVS3      149
                   200 CONTINUE                                                          AVS3      150
      95               IF(.NOT.NEWOR) GOTO 30                                            AVS3      151
                       WRITE(6,3010)                                                     AVS3      152
                  3010 FORMAT(1H1," THE FOLLOWING UNDELIVERED ORDERS WILL BE INCLUDED",  AVS3      153
                      1/," IN THE INPUT FOR THE NEXT AVS RUN")                           AVS3      154
                       WRITE(6,3015)                                                     AVS3      155
      100         3015 FORMAT(//,1H ,"ORDER NO",2X,"LOT SIZE",4X,"TO")                   AVS3      156
                       ICHK=0                                                            AVS3      157
                       DO 250 IPTR=1,200                                                 AVS3      158
                      IF(LSIZE(IPTR).GE.0) GO TO 250                                     AVS3      159
                       ICHK=1                                                            AVS3      160
      105              LSIZE(IPTR)=IABS(LSIZE(IPTR))                                     AVS3      161
                       IF(ISHFT.EQ.0.0) GO TO 25                                         AVS3      162
                       IF(ONUMB(IPTR).EQ.999) GO TO 25                                   AVS3      163
                       EMERG=0                                                           AVS3      164
                       IF(ONUMB(IPTR).LT.0) EMERG=1                                      AVS3      165
      110              NAME=4HZZZZ                                                       AVS3      166
                       ORG=ORIGN(IPTR)                                                   AVS3      167
                       DEST=TERMN(IPTR)                                                  AVS3      168
                       PAL=LSIZE(IPTR)                                                   AVS3      169
                       CALL UPDATE                                                       AVS3      170
```

```
                      WRITE(12,3000)ONUMB(IPTR),LSIZE(IPTR),ORIGN(IPTR),TERMN(IPTR)      AVS3   171
                3000  FORMAT(2I5,2A6)                                                    AVS3   172
                      WRITE(6,3005)ONUMB(IPTR),LSIZE(IPTR),ORIGN(IPTR),TERMN(IPTR)       AVS3   173
                3005  FORMAT(1H ,I5,5X,I5,6X,A6,2X,A6)                                   AVS3   174
                 250  CONTINUE                                                           AVS3   175
                      IF(ICHK.EQ.0) GO TO 28                                             AVS3   176
                      GOTO 30                                                            AVS3   177
                28    WRITE(6,3020)                                                      AVS3   178
                3020  FORMAT(" ALL ORDERS SCHEDULED FOR DELIVERY")                       AVS3   179
               C END   AVS INPUT                                                         AVS3   180
                30    REWIND DEV1                                                        AVS3   181
                      SHIFT=ISHFT                                                        AVS3   182
                35    READ(DEV1,1500,END=100)TDTE,TD2,TSHFT,TMARK,TINME,TORIG,TDSTN,     AVS3   183
                     1 TREGP,TEPAL                                                       AVS3   184
                1500  FORMAT(2I6,F6.1,I6,5GA4,10GA6,10GI6)                               AVS3   185
                      IF(TDTE.EQ.0) GOTO 100                                             AVS3   186
                      IF(TDTE.GT.DATE)GOTO 80                                            AVS3   187
                      IF(TDTE.EQ.DATE) GOTO 40                                           AVS3   188
                38    WRITE(11,1500)DATE,D2,ISHFT,IMARK,INAME,ORIG,DSTN,REGP,EPAL        AVS3   189
                      WRITE(11,1500)TDTE,TD2,TSHFT,TMARK,TINME,TORIG,TDSTN,TREGP,TEPAL   AVS3   190
                      DATE=0                                                             AVS3   191
                      GOTO 35                                                            AVS3   192
                40    IF(TDTE.EQ.TD2)GOTO 50                                             AVS3   193
                      WRITE(11,1500)DATE,D2,ISHFT,IMARK,INAME,ORIG,DSTN,REGP,EPAL        AVS3   194
                      DATE=0                                                             AVS3   195
                      GOTO 35                                                            AVS3   196
                50    IF(TSHFT.GT.ISHFT)GOTO 38                                          AVS3   197
                      IF(TSHFT.EQ.ISHFT) GOTO 55                                         AVS3   198
                      GOTO 80                                                            AVS3   199
                55    WRITE(11,1500)DATE,D2,ISHFT,IMARK,INAME,ORIG,DSTN,REGP,EPAL        AVS3   200
                      DATE=0                                                             AVS3   201
                      GOTO 35                                                            AVS3   202
                80    WRITE(11,1500)TDTE,TD2,TSHFT,TMARK,TINME,TORIG,TDSTN,TREGP,TEPAL   AVS3   203
                      GOTO 35                                                            AVS3   204
                100   IF(DATE.NE.0)WRITE(11,1500)DATE,D2,ISHFT,IMARK,INAME,ORIG,         AVS3   205
                     1 DSTN,REGP,EPAL                                                    AVS3   206
                      CALL ENDF(11)                                                      AVS3   207
                      DEV1=11                                                            AVS3   208
                      RETURN                                                             AVS3   209
                5000  CALL ERROR(200)                                                    AVS3   210
                      STOP                                                               AVS3   211
                      END                                                                AVS3   212
```


CRDRD
DEV1=8
DEV2=9
UPDT=.T.
UPDTE=.F.
DATE=0
B
READ INPUT
FROM UNIT
5
END-OF-
FILE?
Y
D
N
REFORMAT
DATE FROM
INPUT
(YRMODA)
DATE
.EQ.
0
Y
N
C
Y
N
CALL
RPLCE
CALL RPRT
(DATE1,
DATE2,
SHFT)
IDATE=YRMODA
SHIFT=SHFT
MARK=0
A


A
CALL
DTFND
(IDATE, SHIFT,
MARK)
IDATE
.EQ.
0
Y
B
C
N
CALL UPDATE
DATE1=DATE
DATE2=D2
SHIF2=ISHFT
B
D
DATE
.NE.
0
Y
CALL RPLCE
N
DATE=0
DATE1
.NE.
0
Y
CALL RPRT
(DATE1, DATE2,
SHIF2)
E

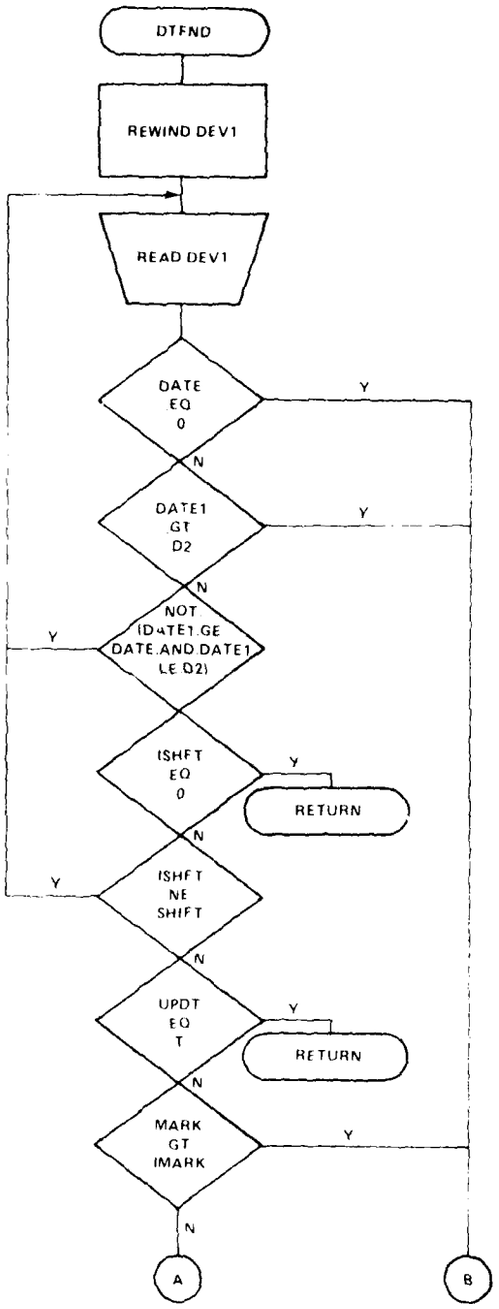

E
TRANSFORM FILE
FROM DEV1
TO TAPE11
RETURN

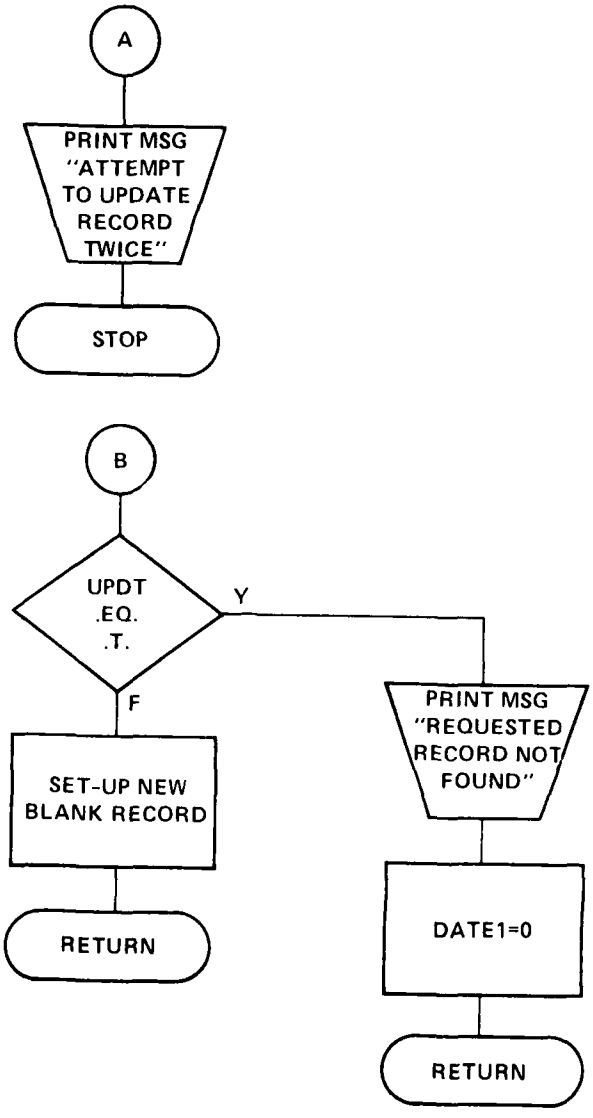
```
      SUBROUTINE CRDRD                                                  CRDRD      2
C ALPHANUMERICS                                                         CRDRD      3
      ALPHA NAME,TRK,ORG,DEST,TINME(50),TORIG(50),TDSTN(50),INAME(50),  CRDRD      4
     1 ORIG(50),DSTN(50)                                                CRDRD      5
C BINARY                                                                CRDRD      6
      INTEGER YRMODA,PAL,EMERG,TDTE,TREGP(50),TEPAL(50),DATE,           CRDRD      7
     1REGP(50),EPAL(50)                                                 CRDRD      8
      INTEGER IMARK,TMARK,MARK,D2,TD2,DEV1,DEV2,DATE1,DATE2,DARRY(10)   CRDRD      9
      REAL SHFT,ISHFT,TSHFT,SHIF2                                       CRDRD     10
      LOGICAL UPDTE                                                     CRDRD     11
      LOGICAL UPDT                                                      CRDRD     12
      COMMON/AVSRC1/YRMODA,PAL,EMERG,IFTN                               CRDRD     13
      COMMON/AVSRC2/SHFT                                                CRDRD     14
      COMMON/AVSRC3/NAME,TRK,ORG,DEST                                   CRDRD     15
      COMMON/TMPRC1/TDTE,TD2,TMARK,TREGP,TEPAL                          CRDRD     16
      COMMON/TMPRC2/TSHFT                                               CRDRD     17
      COMMON/TMPRC3/TINME,TORIG,TDSTN                                   CRDRD     18
      COMMON/HISRC1/DATE,D2,IMARK,REGP,EPAL                             CRDRD     19
      COMMON/HISRC2/ISHFT                                               CRDRD     20
      COMMON/HISRC3/INAME,ORIG,DSTN                                     CRDRD     21
      COMMON/CNTRL/UPDT,DARRY,DEV1,DEV2,UPDTE                           CRDRD     22
      DEV1=8                                                            CRDRD     23
      DEV2=9                                                            CRDRD     24
      UPDT=.T.                                                          CRDRD     25
      UPDTE=.F.                                                         CRDRD     26
      DATE=0                                                            CRDRD     27
    3 READ(5,1000,END=70)YRMODA,SHFT,NAME,ORG,DEST,PAL,EMERG,IFTN       CRDRD     28
 1000 FORMAT(I6,F6.1,A4,2A6,I5,2I1)                                     CRDRD     29
      IYR=MOD(YRMODA,100)                                               CRDRD     30
      IDATE2=YRMODA/100                                                 CRDRD     31
      FIYR=FLOAT(IYR)                                                   CRDRD     32
      FDTE=FLOAT(IDATE2)                                                CRDRD     33
      FDTE2=FDTE*100.0+FIYR                                             CRDRD     34
      YRMODA=IFIX(FDTE2)                                                CRDRD     35
      IF (DATE.EQ.0) GOTO 45                                            CRDRD     36
      IF(YRMODA.LE.D2.AND.YRMODA.GE.DATE.AND.                           CRDRD     37
     1 (SHFT.EQ.ISHFT.OR.ISHFT.EQ.0.))GOTO 60                           CRDRD     38
      CALL RPLCE                                                        CRDRD     39
      CALL RPRT(DATE1,DATE2,SHIF2)                                      CRDRD     40
   45 IDATE=YRMODA                                                      CRDRD     41
      SHIFT=SHFT                                                        CRDRD     42
      MARK=0                                                            CRDRD     43
      CALL OTENQ(IDATE,SHIFT,MARK)                                      CRDRD     44
      IF(IDATE.EQ.0) GOTO 3                                             CRDRD     45
      DATE1=DATE                                                        CRDRD     46
      DATE2=D2                                                          CRDRD     47
      SHIF2=ISHFT                                                       CRDRD     48
   60 CALL UPDATE                                                       CRDRD     49
      DATE1=DATE                                                        CRDRD     50
      DATE2=D2                                                          CRDRD     51
      SHIF2=ISHFT                                                       CRDRD     52
      GOTO 3                                                            CRDRD     53
   70 IF(DATE.NE.0) CALL RPLCE                                          CRDRD     54
      DATE=0                                                            CRDRD     55
      IF(DATE1.NE.0) CALL RPRT(DATE1,DATE2,SHIF2)                       CRDRD     56
      REWIND DEV1                                                       CRDRD     57
   75 READ(DEV1,1500,END=5000)TDTE,TD2,TSHFT,TMARK,TINME,TORIG,TDSTN,   CRDRD     58
     1TREGP,TEPAL                                                       CRDRD     59
      IF(TDTE.EQ.0) GOTO 5000                                           CRDRD     60
 1500 FORMAT(2I6,F6.1,I5,50A4,100A6,100I6)                              CRDRD     61
      WRITE(11,1500)TDTE,TD2,TSHFT,TMARK,TINME,TORIG,TDSTN,TREGP,TEPAL  CRDRD     62
      GOTO 75                                                           CRDRD     63
 5000 CALL ENDF(11)                                                     CRDRD     64
      RETURN                                                            CRDRD     65
      END                                                               CRDRD     66
```

```
SUBROUTINE OMPIT      74/74   OPT=0 ROUND=*/ TRACE          FTN 4.6+460      10/15/80  12.23.05

      1               SUBROUTINE OMPIT                                          ERR       8
                    C ALPHA                                                     ERR       9
                      ALPHA INAME(50),ORIG(50),OSTN(50)                         ERR      10
                    C BINARY                                                    ERR      11
      5               INTEGER D2                                                ERR      12
                      INTEGER DATE,REGP(50),EPAL(50)                            ERR      13
                      REAL ISHFT                                                ERR      14
                      COMMON/HISRC1/DATE,D2,IMARK,REGP,EPAL                     ERR      15
                      COMMON/HISRC2/ISHFT                                       ERR      16
     10               COMMON/HISRC3/INAME,ORIG,OSTN                             ERR      17
                      DATE=0                                                    ERR      18
                      REWIND 11                                                 ERR      19
                   10 READ(11,1000,END=20)DATE,D2,ISHFT,IMARK,INAME,ORIG,OSTN,REGP,EPAL  ERR  20
                 1000 FORMAT(2I6,F6.1,I6,50A4,100A6,100I6)                      ERR      21
     15               IF(DATE.EQ.0) GOTO 20                                     ERR      22
                      PRINT 1200,DATE,ISHFT                                     ERR      23
                 1200 FORMAT("1",I6,F6.1)                                       ERR      24
                      DO  15 I=1,50                                             ERR      25
                      PRINT 1500,INAME(I),ORIG(I),OSTN(I),REGP(I),EPAL(I)       ERR      26
     20           1500 FORMAT(2H  ,A4,2H  ,A6,2H  ,A6,2H  ,I6,2H  ,I6)          ERR      27
                   15 CONTINUE                                                  ERR      28
                      GOTO 10                                                   ERR      29
                   20 PRINT 2900                                                ERR      30
                   2900 FORMAT(" END OF FILE")                                  ERR      31
     25               RETURN                                                    ERR      32
                      END                                                       ERR      33


      1               SUBROUTINE  DATRAN(DATEIN,IDA,IYR,MONTH)                  DTRN       2
                    C ALPHA                                                     DTRN       3
                      ALPHA MOTBLE(12),MONTH                                    DTRN       4
                    C BINARY                                                    DTRN       5
      5               INTEGER DATEIN,IDA,IYR                                    DTRN       6
                      DATA MOTBLE/3HJAN,3HFEB,3HMAR,3HAPR,3HMAY,3HJUN,3HJUL,3HAUG,  DTRN   7
                     1 3HSEP,3HOCT,3HNOV,3HDEC/                                 DTRN       8
                      IYR=DATEIN/10000                                          DTRN       9
                      IMO=(DATEIN-10000*IYR)/100                                DTRN      10
     10               IDA=DATEIN-10000*IYR-100*IMO                              DTRN      11
                      MONTH=MOTBLE(IMO)                                         DTRN      12
                      RETURN                                                    DTRN      13
                      END                                                       DTRN      14
```


DTFND
REWIND DEV1
READ DEV1
DATE EQ 0
Y
N
DATE1 GT D2
Y
N
NOT (DATE1.GE. DATE.AND.DATE1 .LE.D2)
Y
ISHFT EQ 0
Y
RETURN
N
ISHFT NE SHIFT
Y
N
UPDT EQ T
Y
RETURN
N
MARK GT IMARK
Y
N
A
B


A
PRINT MSG "ATTEMPT TO UPDATE RECORD TWICE"
STOP
B
UPDT .EQ. .T.
Y
F
SET-UP NEW BLANK RECORD
RETURN
PRINT MSG "REQUESTED RECORD NOT FOUND"
DATE1=0
RETURN

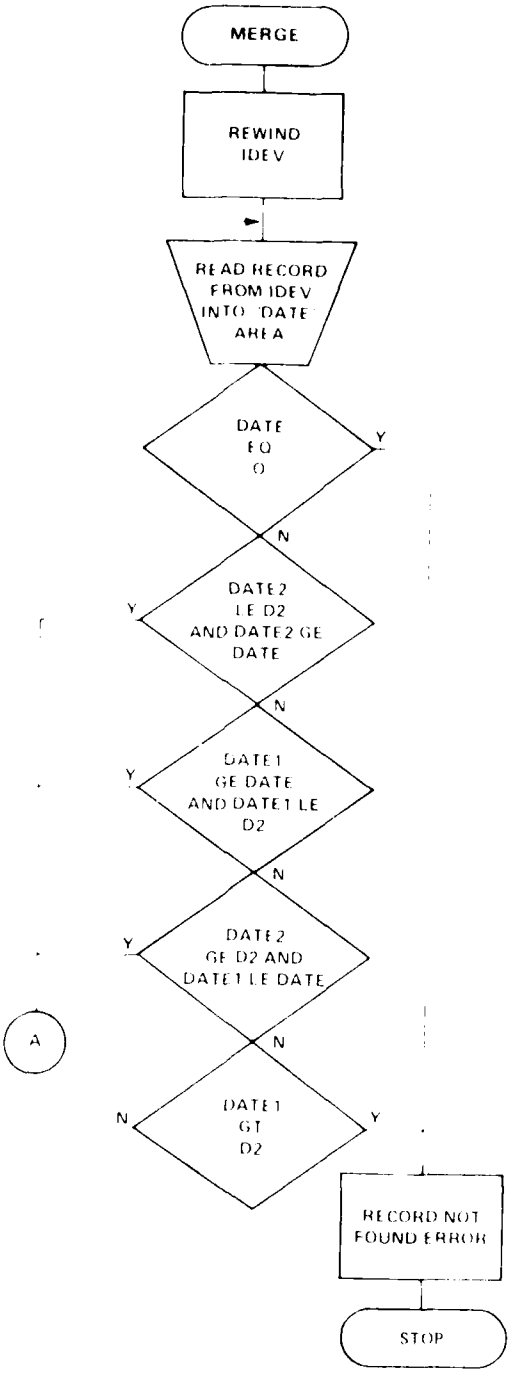
```
SUBROUTINE DTFND      7+/74   OPT=0 ROUND=*/ TRACE          FTN 4.6+460        10/15/80  12.23.05

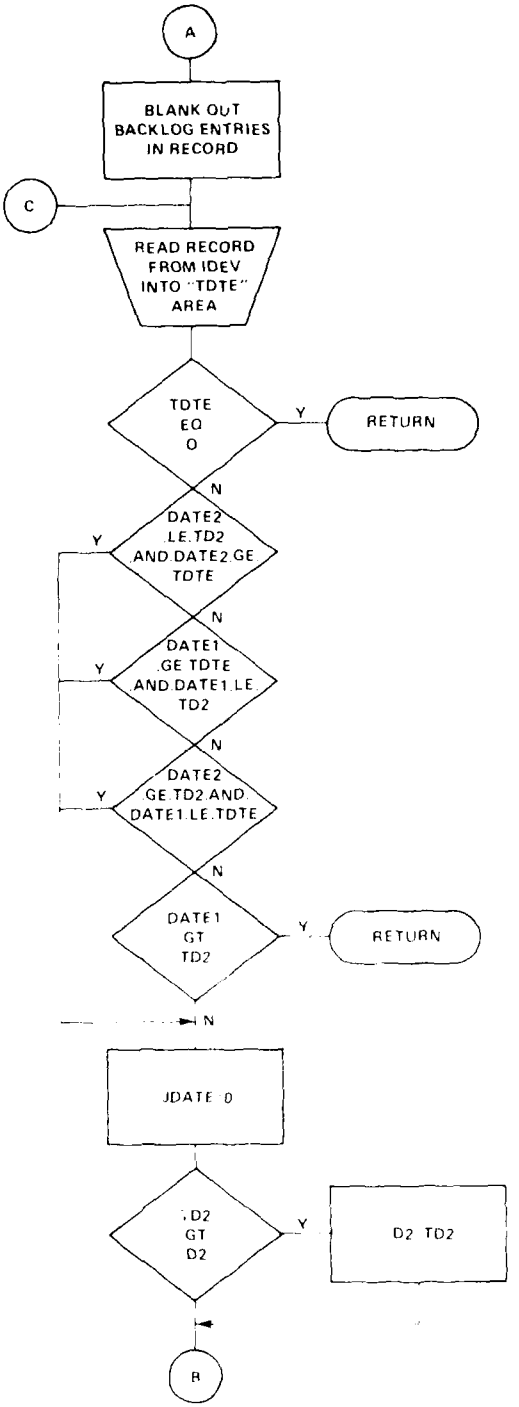
 1                SUBROUTINE DTFND(DATE1,SHIFT,MARK)                          DTFND      2
                C ALPHANUMERIC                                                DTFND      3
                  ALPHA INAME(50),ORIG(50),DSTN(50)                           DTFND      4
                C BINARY                                                      DTFND      5
 5                INTEGER DATE,CARRY(10),JSAVE,REGP(50),EPAL(50),             DTFND      6
                 1DEV1,DEV2,DATE1,D2,IMARK                                    DTFND      7
                  REAL SHIFT,ISHFT                                            DTFND      8
                  LOGICAL UPDTE,UPDT                                          DTFND      9
                  COMMON/HISRC1/DATE,D2,IMARK,REGP,EPAL                       DTFND     10
10                COMMON/HISRC2/ISHFT                                         DTFND     11
                  COMMON/HISRC3/INAME,ORIG,DSTN                               DTFND     12
                  COMMON/CNTRL/LPDT,CARRY,DEV1,DEV2,UPDTE                     DTFND     13
                  REWIND DEV1                                                 DTFND     14
                10  READ(DEV1,1000,END=20)DATE,D2,ISHFT,IMARK,INAME,ORIG,DSTN,REGP,  DTFND  15
15                1 EPAL                                                      DTFND     16
                1000 FORMAT(2I6,F6.1,I6,50A4,100A6,100I6)                     DTFND     17
                  IF(DATE.EQ.0) GOTO 20                                       DTFND     18
                  IF(DATE1.GT.D2)GOTO 20                                      DTFND     19
                  IF(.NOT.(DATE1.GE.DATE.AND.DATE1.LE.D2))GOTO 10             DTFND     20
20                IF(ISHFT.EQ.0) RETURN                                       DTFND     21
                  IF(ISHFT.NE.SHIFT)GOTO 10                                   DTFND     22
                  IF(UPDT) RETURN                                             DTFND     23
                  IF(MARK.GT.IMARK)GOTO 20                                    DTFND     24
                  PRINT 2000                                                  DTFND     25
25                2000 FORMAT(" ATTEMPT TO UPDATE RECORD TWICE WITH SAME DATA",  DTFND  26
                 1/," PROGRAM ABORTED")                                       DTFND     27
                  STOP                                                        DTFND     28
                20  IF(UPDT) GOTO 40                                          DTFND     29
                  DATE=DATE1                                                  DTFND     30
30                D2=DATE1                                                    DTFND     31
                  ISHFT=SHIFT                                                 DTFND     32
                  IMARK=MARK                                                  DTFND     33
                  DO 35 J=1,50                                                DTFND     34
                  INAME(J)=10H                                                DTFND     35
35                ORIG(J)=10H                                                 DTFND     36
                  DSTN(J)=10H                                                 DTFND     37
                  REGP(J)=0                                                   DTFND     38
                30  EPAL(J)=0                                                 DTFND     39
                  RETURN                                                      DTFND     40
40                40  PRINT 3000,DATE1,SHIFT                                  DTFND     41
                3000 FORMAT(" NO RECORD FOUND IN HISTORY FILE FOR ENTRY WITH DATE ",  DTFND  42
                 1 F6.1," AND SHIFT ",F6.1)                                   DTFND     43
                  DATE1=0                                                     DTFND     44
                  RETURN                                                      DTFND     45
45                END                                                         DTFND     46
```

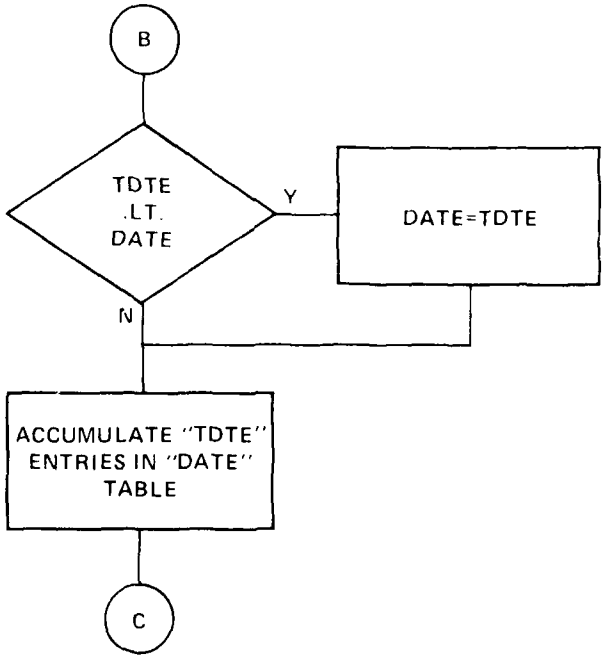
```
SUBROUTINE ERROR      74/74   CPT=0 ROUND=*/ TRACE          FTN 4.6+460      10/15/80  12.23.05

      1               SUBROUTINE ERROR(MSGNO)                                  ERR       2
                      INTEGER MSGNO                                            ERR       3
                      PRINT 1000,MSGNO                                         ERR       4
                 1000 FORMAT(" ERROR NUMBER ",I4)                              ERR       5
      5               STOP                                                     ERR       6
                      END                                                      ERR       7


      1               SUBROUTINE ENDF(ICEV)                                    ENDF      2
                      INTEGER DATE,D2,IMARK,REGP(50),EPAL(50)                  ENDF      3
                      REAL ISHFT                                               ENDF      4
                      ALPHA INAME(50),ORIG(50),OSTN(50)                        ENDF      5
      5               COMMON/HISRC1/DATE,D2,IMARK,REGP,EPAL                    ENDF      6
                      COMMON/HISRC2/ISHFT                                      ENDF      7
                      COMMON/HISRC3/INAME,ORIG,OSTN                            ENDF      8
                      DATE=0                                                   ENDF      9
                      WRITE(11,1500)DATE,D2,ISHFT,IMARK,INAME,ORIG,OSTN,REGP,EPAL  ENDF  10
     10               FORMAT(2I6,F6.1,I6,50A4,100A6,100I6)                     ENDF      11
                      RETURN                                                   ENDF      12
                      END                                                      ENDF      13
```


MERGE
REWIND IDEV
READ RECORD FROM IDEV INTO 'DATE' AREA
DATE EQ 0
Y
N
DATE2 LE D2 AND DATE2 GE DATE
Y
N
DATE1 GE DATE AND DATE1 LE D2
Y
N
DATE2 GE D2 AND DATE1 LE DATE
Y
N
A
DATE1 GT D2
N
Y
RECORD NOT FOUND ERROR
STOP


A
BLANK OUT BACKLOG ENTRIES IN RECORD
C
READ RECORD FROM IDEV INTO "TDTE" AREA
TDTE EQ 0
Y
RETURN
N
DATE2 .LE.TD2 .AND.DATE2.GE. TDTE
Y
N
DATE1 .GE.TDTE .AND.DATE1.LE. TD2
Y
N
DATE2 .GE.TD2.AND. DATE1.LE.TDTE
Y
N
DATE1 GT TD2
Y
RETURN
N
JDATE 0
TD2 GT D2
Y
D2 TD2
B


B
TDTE
.LT.
DATE
Y
DATE=TDTE
N
ACCUMULATE "TDTE"
ENTRIES IN "DATE"
TABLE
C

```
SUBROUTINE MERGE      74/74   OPT=0 ROUND=*/ TRACE          FTN 4.6+460        10/15/80  12.23.05

      SUBROUTINE MERGE(DATE1,DATE2,IDEV)                                    MRGE      2
C DATE1-START DATE  DATE2-TERMINAL DATE                                     MRGE      3
C BINARY                                                                    MRGE      4
      INTEGER DATE1,DATE2,IPTR2(50),DATE,D2,IMARK,SEARCH,                   MRGE      5
     1REGP(50),EPAL(50),TDTE,TD2,TMARK,TREGP(50),TEPAL(50)                  MRGE      6
      LOGICAL RESET                                                         MRGE      7
      REAL ISHFT,TSHFT,SHIFT                                                MRGE      8
C ALPHA                                                                     MRGE      9
      ALPHA TMPOR,TMPOS,ADATE1,ADATE2,INAME(50),ORIG(50),DSTN(50),          MRGE     10
     1TINME(50),TDSTN(50),TORIG(50),JNAME,JORG,JDEST                        MRGE     11
      COMMON/TMPRC1/TDTE,TD2,TMARK,TREGP,TEPAL                              MRGE     12
      COMMON/TMPRC2/TSHFT                                                   MRGE     13
      COMMON/TMPRC3/TINME,TORIG,TDSTN                                       MRGE     14
      COMMON/HISRC1/DATE,D2,IMARK,REGP,EPAL                                 MRGE     15
      COMMON/HISRC2/ISHFT                                                   MRGE     16
      COMMON/HISRC3/INAME,ORIG,DSTN                                         MRGE     17
      REWIND IDEV                                                           MRGE     18
      READ(IDEV,1000,END=5000)DATE,D2,ISHFT,IMARK,INAME,ORIG,DSTN,REGP,     MRGE     19
     1 EPAL                                                                 MRGE     20
 1000 FORMAT(2I6,F6.1,I6,5UA4,10UA6,10UI6)                                  MRGE     21
      IF(DATE.EQ.0) GOTO 5000                                               MRGE     22
   10 IF(DATE2.LE.D2.AND.DATE2.GE.DATE)GOTO 20                              MRGE     23
      IF(DATE1.GE.DATE.AND.DATE1.LE.D2)GOTO 20                              MRGE     24
      IF(DATE2.GE.D2.AND.DATE1.LE.DATE)GOTO 20                              MRGE     25
      IF(DATE1.GT.D2) GOTO 16                                               MRGE     26
   15 READ(IDEV,1000,END=16)DATE,D2,ISHFT,IMARK,INAME,ORIG,DSTN,REGP,       MRGE     27
     1 EPAL                                                                 MRGE     28
      IF(DATE.EQ.0) GOTO 16                                                 MRGE     29
      GOTO 10                                                               MRGE     30
   16 PRINT 4000                                                            MRGE     31
 4000 FORMAT(1H ,"RECORD NOT FOUND FOR REQUESTED DATES AND/OR SHIFT")       MRGE     32
      STOP                                                                  MRGE     33
   20 DO 25 I=1,50                                                          MRGE     34
      IF(INAME(I).NE.4HZZZZ)GOTO 25                                         MRGE     35
      ORIG(I)=10H                                                           MRGE     36
      DSTN(I)=10H                                                           MRGE     37
      INAME(I)=10H                                                          MRGE     38
      REGP(I)=0                                                             MRGE     39
      EPAL(I)=0                                                             MRGE     40
   25 CONTINUE                                                              MRGE     41
   27 READ(IDEV,1000,END=5010)TDTE,TD2,TSHFT,TMARK,TINME,TORIG,TDSTN,       MRGE     42
     1 TREGP,TEPAL                                                          MRGE     43
      IF(TDTE.EQ.0) RETURN                                                  MRGE     44
      IF(DATE2.LE.TD2.AND.DATE2.GE.TDTE)GOTO 30                             MRGE     45
      IF(DATE1.GE.TDTE.AND.DATE1.LE.TD2)GOTO 30                             MRGE     46
      IF(DATE2.GE.TD2.AND.DATE1.LE.TDTE) GOTO 30                            MRGE     47
      IF(DATE1.GT.TD2) RETURN                                               MRGE     48
   30 JDATE=0                                                               MRGE     49
      IF(TD2.GT.D2) D2=TD2                                                  MRGE     50
      IF(TDTE.LT.DATE)DATE=TDTE                                             MRGE     51
      DO 42 I=1,50                                                          MRGE     52
      IF(TINME(I).EQ.10H           .AND.TORIG(I).EQ.10H           .AND.     MRGE     53
     1TDSTN(I).EQ.10H           ) GOTO  42                                  MRGE     54
      IF(TINME(I).EQ.4HZZZZ)GOTO 42                                         MRGE     55
      JNAME=TINME(I)                                                        MRGE     56
      JORG=TORIG(I)                                                         MRGE     57
      JDEST=TDSTN(I)                                                        MRGE     58
```

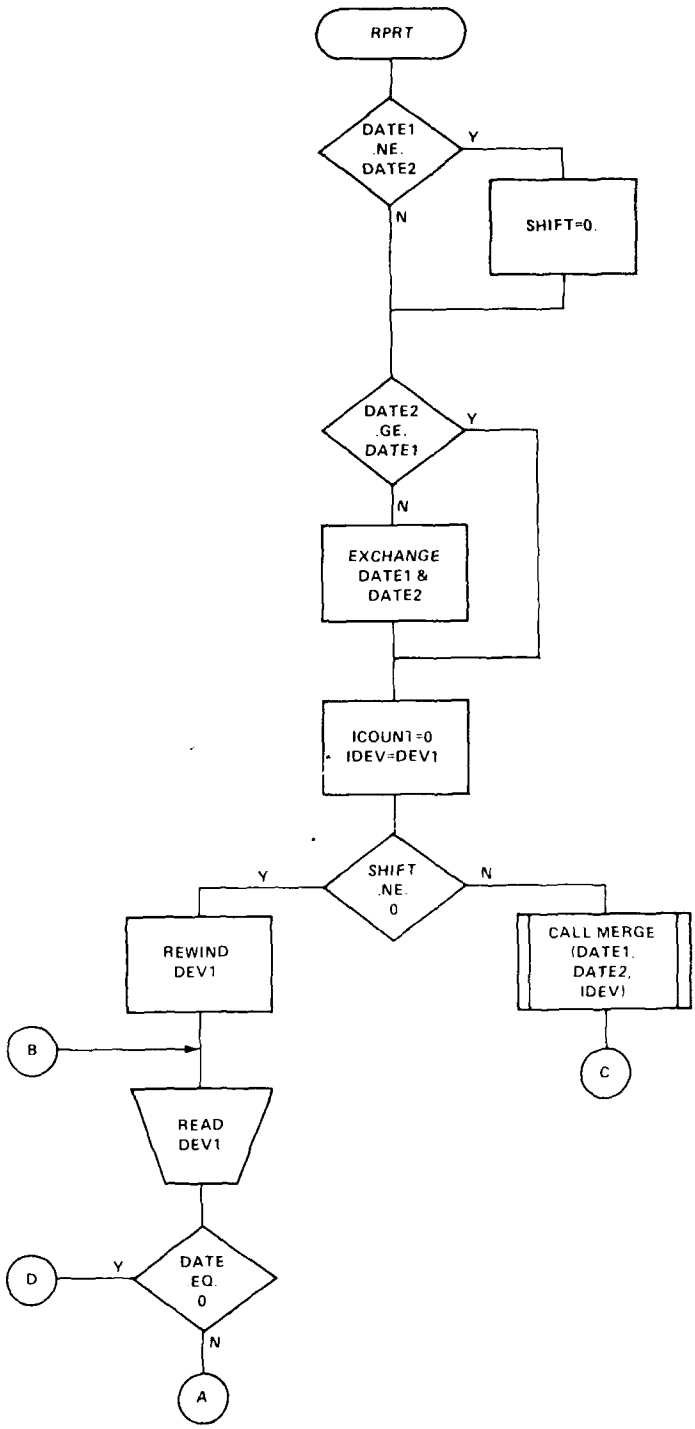
```
                RESET=.T.                                                    MRGE    59
                INDEX=SEARCH(JDATE,JNAME,JORG,JDEST,RESET)                   MRGE    60
60              IF(INDEX.NE.0) GOTO 35                                       MRGE    61
                JNAME=10H                                                    MRGE    62
                JORG=10H                                                     MRGE    63
                JDEST=10H                                                    MRGE    64
                INDEX=SEARCH(JDATE,JNAME,JORG,JDEST,RESET)                   MRGE    65
65              IF(INDEX.EQ.0)GOTO 40                                        MRGE    66
                INAME(INDEX)=TINME(I)                                        MRGE    67
                ORIG(INDEX)=TORIG(I)                                         MRGE    68
                DSTN(INDEX)=TDSTN(I)                                         MRGE    69
           35   RECGP(INDEX)=RECGP(INDEX)+TREGP(I)                           MRGE    70
70              EPAL(INDEX)=EPAL(INDEX)+TEPAL(I)                             MRGE    71
                GOTO 42                                                      MRGE    72
           40   PRINT 1500,TOTE,TC2,TORIG(I),TDSTN(I),TINME(I),TREGP(I),TEPAL(I) MRGE   73
         1500   FORMAT(" FOLLOWING ENTRY NOT INCLUDED ",2I6,2A6,A4,2I6)      MRGE    74
           42   CONTINUE                                                     MRGE    75
75              GOTO 27                                                      MRGE    76
         5000   CALL ERROR(3,0)                                              MRGE    77
         5010   RETURN                                                       MRGE    78
                END                                                          MRGE    79
```

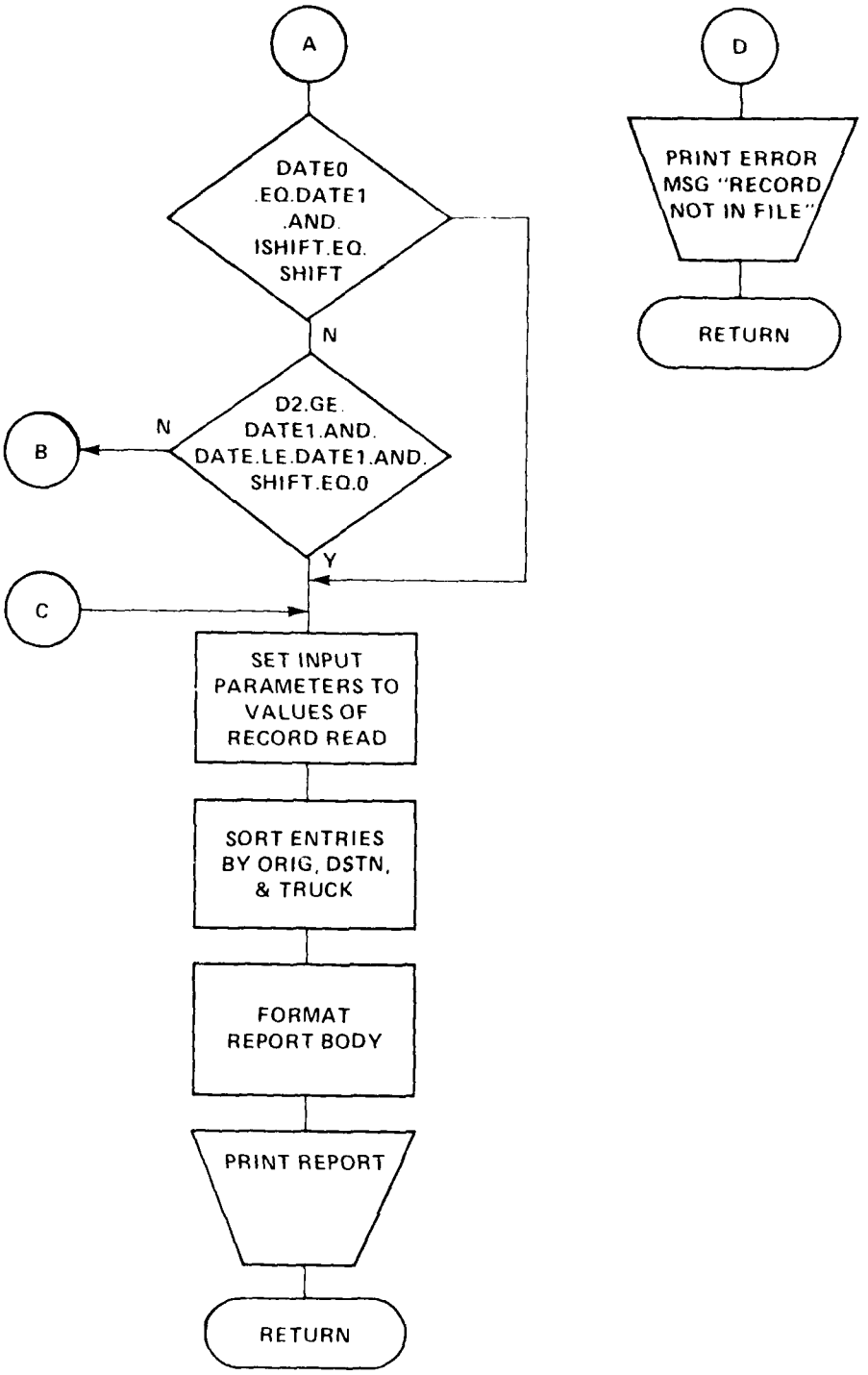
```
SUBROUTINE MRGIT      74/74   OPT=0 ROUND=*/ TRACE          FTN 4.6+460        10/15/80  12.23.05

      1               SUBROUTINE MRGIT(DATE1,DATE2)                                    ENDF      14
                      ALPHA TINME(50),TORIG(50),TOSTN(50),INAME(50),ORIG(50),OSTN(50)  ENDF      15
                      INTEGER DEV1,DEV2,CARRY(10),TREGP(50),TEPAL(50),REGP(50),EPAL(50), ENDF    16
                     1DATE,TDTE,D2,TD2,IMARK,TMARK,DATE1,DATE2                         ENDF      17
      5               REAL TSHFT,ISHFT                                                 ENDF      18
                      LOGICAL UPDT,UPDTE                                               ENDF      19
                      COMMON/TMPRC1/TDTE,TD2,TMARK,TREGP,TEPAL                         ENDF      20
                      COMMON/TMPRC2/TSHFT                                              ENDF      21
                      COMMON/TMPRC3/TINME,TORIG,TOSTN                                  ENDF      22
     10               COMMON/HISRC1/DATE,D2,IMARK,REGP,EPAL                            ENDF      23
                      COMMON/HISRC2/ISHFT                                              ENDF      24
                      COMMON/HISRC3/INAME,ORIG,OSTN                                    ENDF      25
                      COMMON/CNTRL/UPDT,CARRY,DEV1,DEV2,UPDTE                          ENDF      26
                      DEV1=8                                                           ENDF      27
     15               REWIND DEV1                                                      ENDF      28
                      IDEV=DEV1                                                        ENDF      29
                      IF(DATE2.GE.DATE1) GOTO 10                                       ENDF      30
                      ITEMP=DATE1                                                      ENDF      31
                      DATE1=DATE2                                                      ENDF      32
     20               DATE2=ITEMP                                                      ENDF      33
                10    CALL MERGE(DATE1,DATE2,IDEV)                                     ENDF      34
                      DATE2=D2                                                         ENDF      35
                      DATE1=DATE                                                       ENDF      36
                      REWIND DEV1                                                      ENDF      37
     25               ISHFT=0.                                                         ENDF      38
                      IMARK=0                                                          ENDF      39
                      READ(DEV1,1000,END=5000)TDTE,TD2,TSHFT,TMARK,TINME,TORIG,TOSTN,  ENDF      40
                     1TREGP,TEPAL                                                      ENDF      41
                1000 FORMAT(2I6,F6.1,I6,50A4,100A6,100I6)                              ENDF      42
     30         15    IF(DATE2.LE.TD2.AND.DATE2.GE.TDTE) GOTO 20                       ENDF      43
                      IF(DATE1.LE.TD2.AND.DATE1.GE.TDTE)GOTO 20                        ENDF      44
                      IF(DATE2.GE.TD2.AND.DATE1.LE.TDTE) GOTO 20                       ENDF      45
                      WRITE(11,1000)TDTE,TD2,TSHFT,TMARK,TINME,TORIG,TOSTN,TREGP,TEPAL ENDF      46
                      GOTO 30                                                          ENDF      47
     35         20    IF(DATE.NE.0)WRITE(11,1000)DATE,D2,ISHFT,IMARK,INAME,ORIG,OSTN,  ENDF      48
                     1 REGP,EPAL                                                       ENDF      49
                      DATE=0                                                           ENDF      50
                30    READ(DEV1,1000,END=40)TDTE,TD2,TSHFT,TMARK,TINME,TORIG,TOSTN,TREGP ENDF    51
                     1,TEPAL                                                           ENDF      52
     40               IF(TDTE.EQ.0) GOTO 40                                            ENDF      53
                      GOTO 15                                                          ENDF      54
                40    IF(DATE.NE.0)WRITE(11,1000)DATE,D2,ISHFT,IMARK,INAME,ORIG,OSTN,  ENDF      55
                     1 REGP,EPAL                                                       ENDF      56
                      CALL ENDF(11)                                                    ENDF      57
     45               DEV1=11                                                          ENDF      58
                      RETURN                                                           ENDF      59
                5000  CALL ERROR(300)                                                  ENDF      60
                      END                                                              ENDF      61
```

```
SUBROUTINE RPLCE      74/74   OPT=0 ROUND=*/ TRACE          FTN 4.6+460        10/15/80  12.23.05

1                SUBROUTINE RPLCE                                                RPLCE      2
                                                                                 RPLCE      3
               C ALPHANUMERICS                                                   RPLCE      4
                 ALPHA NAME,TRK,ORG,DEST,TINME(50),TORIG(50),TDSTN(50),INAME(50),RPLCE      5
                1 ORIG(50),DSTN(50)                                              RPLCE      6
5              C BINARY                                                          RPLCE      7
                 INTEGER YRMODA,PAL,EMERG,TDTE,TREGP(50),TEPAL(50),DATE,DARRY(10),RPLCE      8
                1REGP(50),EPAL(50)                                               RPLCE      9
                 INTEGER IMARK,IMARK,MARK,C2,TC2,DEV1,DEV2                       RPLCE     10
                 REAL SHFT,ISHFT,TSHFT                                           RPLCE     11
10               LOGICAL UPDTE                                                   RPLCE     12
                 LOGICAL UPDT                                                    RPLCE     13
                 COMMON/AVSRC1/YRMODA,PAL,EMERG,IFTN                             RPLCE     14
                 COMMON/AVSRC2/SHFT                                              RPLCE     15
                 COMMON/AVSRC3/NAME,TRK,ORG,DEST                                 RPLCE     16
15               COMMON/TMPRC1/TDTE,TD2,TMARK,TREGP,TEPAL                        RPLCE     17
                 COMMON/TMPRC2/TSHFT                                             RPLCE     18
                 COMMON/TMPRC3/TINME,TORIG,TDSTN                                 RPLCE     19
                 COMMON/HISRC1/DATE,D2,IMARK,REGP,EPAL                           RPLCE     20
                 COMMON/HISRC2/ISHFT                                             RPLCE     21
20               COMMON/HISRC3/INAME,ORIG,DSTN                                   RPLCE     22
                 COMMON/CNTRL/UPDT,CARRY,DEV1,DEV2,UPDTE                         RPLCE     23
                 REWIND DEV1                                                     RPLCE     24
                 REWIND DEV2                                                     RPLCE     25
               5 READ(DEV1,1500,END=50)TDTE,TD2,TSHFT,TMARK,TINME,TORIG,TDSTN,TREGP RPLCE     26
25              1,TEPAL                                                          RPLCE     27
            1500 FORMAT(2I6,F6.1,I6,50A4,100A6,100I6)                            RPLCE     28
                 IF(TDTE.EQ.0)GOTO 50                                            RPLCE     29
                 IF(TDTE.GT.DATE) GOTO 40                                        RPLCE     30
                 IF(TDTE.EQ.DATE) GOTO 20                                        RPLCE     31
30            10 WRITE(DEV2,1500)DATE,D2,ISHFT,IMARK,INAME,ORIG,DSTN,REGP,EPAL   RPLCE     32
                 WRITE(DEV2,1500)TDTE,TD2,TSHFT,TMARK,TINME,TORIG,TDSTN,TREGP,   RPLCE     33
                1 TEPAL                                                          RPLCE     34
                 DATE=0                                                          RPLCE     35
                 GOTO 5                                                          RPLCE     36
35            20 IF(TDTE.EQ.TD2) GOTO 25                                         RPLCE     37
                 WRITE(DEV2,1500)DATE,D2,ISHFT,IMARK,INAME,ORIG,DSTN,REGP,       RPLCE     38
                1 EPAL                                                           RPLCE     39
                 DATE=0                                                          RPLCE     40
                 GOTO 5                                                          RPLCE     41
40            25 IF(TSHFT.GT.ISHFT)GOTO 10                                       RPLCE     42
                 IF(TSHFT.EQ.ISHFT)GOTO 30                                       RPLCE     43
                 GOTO 40                                                         RPLCE     44
               30 WRITE(DEV2,1500)DATE,D2,ISHFT,IMARK,INAME,ORIG,DSTN,REGP,      RPLCE     45
                1 EPAL                                                           RPLCE     46
45               DATE=0                                                          RPLCE     47
                 GOTO 5                                                          RPLCE     48
               40 WRITE(DEV2,1500)TDTE,TD2,TSHFT,TMARK,TINME,TORIG,TDSTN,TREGP,  RPLCE     49
                1 TEPAL                                                          RPLCE     50
                 GOTO 5                                                          RPLCE     51
50             50 IF(DATE.NE.0)                                                  RPLCE     52
                1WRITE(DEV2,1500)DATE,D2,ISHFT,IMARK,INAME,ORIG,DSTN,REGP,EPAL  RPLCE     53
                 IDEV = DEV2                                                     RPLCE     54
                 CALL ENDF(IDEV)                                                 RPLCE     55
                 IF(.NOT.UPDTE)CALL CHANGE(8,5HTEMP2)                            RPLCE     56
55               UPDTE=.T.                                                       RPLCE     57
                 ITEMP=DEV1                                                      RPLCE     58
                 DEV1=DEV2
```


RPRT
DATE1 .NE. DATE2
Y
N
SHIFT=0.
DATE2 .GE. DATE1
Y
N
EXCHANGE DATE1 & DATE2
ICOUNT=0 IDEV=DEV1
SHIFT .NE. 0
Y
N
REWIND DEV1
CALL MERGE (DATE1, DATE2, IDEV)
B
C
READ DEV1
D
Y
DATE EQ. 0
N
A


A
DATE0
.EQ.DATE1
.AND.
ISHIFT.EQ.
SHIFT
N
D2.GE.
DATE1.AND.
DATE.LE.DATE1.AND.
SHIFT.EQ.0
N
B
Y
C
SET INPUT
PARAMETERS TO
VALUES OF
RECORD READ
SORT ENTRIES
BY ORIG, DSTN,
& TRUCK
FORMAT
REPORT BODY
PRINT REPORT
RETURN
D
PRINT ERROR
MSG "RECORD
NOT IN FILE"
RETURN

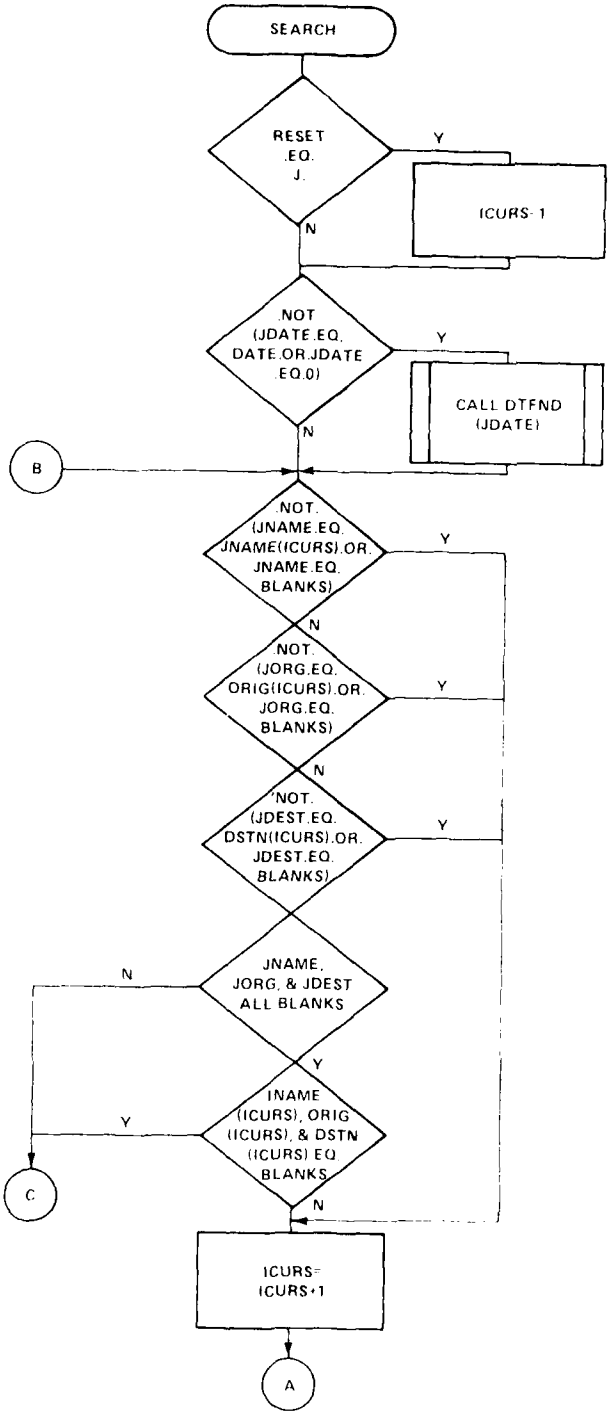
```
SUBROUTINE RPRT       74/74   OPT=0 ROUND=*/ TRACE          FTN 4.6+460        10/15/80  12.23.05

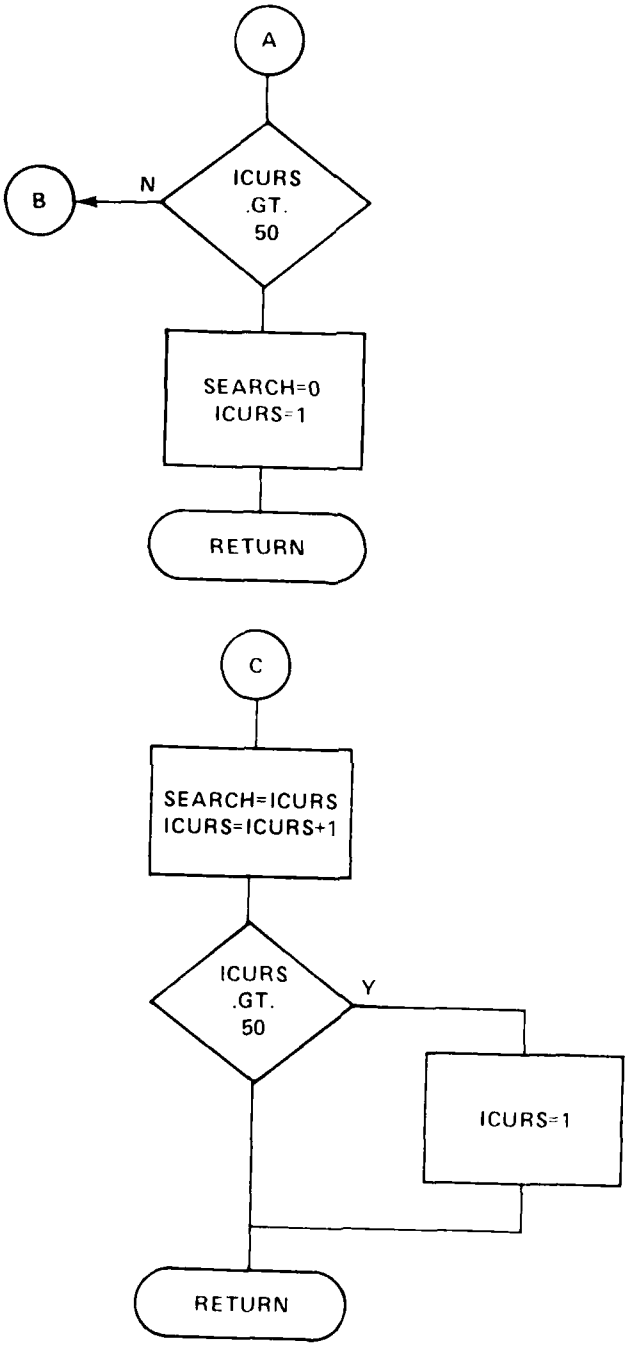
      1               SUBROUTINE RPRT(DATE1,DATE2,SHIFT)                                  RPRT      2
                    C DATE1-START DATE  DATE2-TERMINAL DATE  SHIFT-VALID WHEN DATE1=DATE2 RPRT      3
                    C BINARY                                                              RPRT      4
                          INTEGER DEV2                                                    RPRT      5
      5               INTEGER DATE1,DATE2,IPTR2(50),DATE,D2,IMARK,                        RPRT      6
                     1REGP(50),EPAL(50),TDTE,TD2,TMARK,TREGP(50),TEPAL(50),DEV1,          RPRT      7
                     1 DARRY(10)                                                          RPRT      8
                          LOGICAL UPDT,UPDTE                                              RPRT      9
                          LOGICAL RESET                                                   RPRT     10
     10               REAL ISHFT,TSHFT,SHIFT                                             RPRT     11
                    C ALPHA                                                               RPRT     12
                          ALPHA TMPOR,TMPDS,ADATE1,ADATE2,INAME(50),ORIG(50),OSTN(50),   RPRT     13
                     1TINME(50),TOSTN(50),TORIG(50),MNTH1,MNTH2                           RPRT     14
                          COMMON/TMPRC1/TDTE,TD2,TMARK,TREGP,TEPAL                        RPRT     15
     15               COMMON/TMPRC2/ TSHFT                                               RPRT     16
                          COMMON/TMPRC3/TINME,TORIG,TOSTN                                 RPRT     17
                          COMMON/HISRC1/DATE,D2,IMARK,REGP,EPAL                           RPRT     18
                          COMMON/HISRC2/ISHFT                                             RPRT     19
                          COMMON/HISRC3/INAME,ORIG,OSTN                                   RPRT     20
     20               COMMON/CNTRL/UPDT,DARRY,DEV1,DEV2,UPDTE                            RPRT     21
                          IF(DATE1.NE.DATE2) SHIFT=0.                                     RPRT     22
                          IF(DATE2.GE.DATE1) GOTO 5                                       RPRT     23
                          ITEMP=DATE2                                                     RPRT     24
                          DATE2=DATE1                                                     RPRT     25
     25               DATE1=ITEMP                                                        RPRT     26
                    5     ICOUNT=0                                                      RPRT     27
                          IDEV=DEV1                                                       RPRT     28
                          IF(SHIFT.NE.0.) GOTO 10                                         RPRT     29
                          CALL MERGE(DATE1,DATE2,IDEV)                                    RPRT     30
     30                   GOTO 50                                                        RPRT     31
                    10    REWIND DEV1                                                   RPRT     32
                          READ(DEV1,1000,END=5000)DATE,D2,ISHFT,IMARK,INAME,ORIG,OSTN,REGP,  RPRT  33
                         1EPAL                                                          RPRT     34
                    1000 FORMAT(2I6,F6.1,I6,50A4,100A6,100I6)                           RPRT     35
     35                   IF(DATE.EQ.0) GOTO 5000                                        RPRT     36
                    15    IF(DATE.EQ.DATE1.AND.ISHFT.EQ.SHIFT)GOTO 50                   RPRT     37
                          IF(D2.GE.DATE1.AND.DATE.LE.DATE1.AND.ISHFT.EQ.0.)GOTO 50      RPRT     38
                          READ(DEV1,1000,END=20)DATE,D2,ISHFT,IMARK,INAME,ORIG,OSTN,REGP,  RPRT  39
                         1 EPAL                                                         RPRT     40
     40                   IF(DATE.EQ.0) GOTO 20                                          RPRT     41
                          GOTO 15                                                         RPRT     42
                    20    PRINT 4000                                                    RPRT     43
                    4000 FORMAT(1H ,"RECORD NOT FOUND FOR REQUESTED DATE AND SHIFT")    RPRT     44
                          RETURN                                                          RPRT     45
     45             50    DATE2=D2                                                      RPRT     46
                          DATE1=DATE                                                      RPRT     47
                          SHIFT=ISHFT                                                     RPRT     48
                          DO 52 I=1,50                                                    RPRT     49
                          IF(ORIG(I).EQ.10H           .AND.OSTN(I).EQ.10H           .AND.  RPRT  50
     55                  1 INAME(I).EQ.10H           ) GOTO 52                         RPRT     51
                          ICOUNT=ICOUNT+1                                                 RPRT     52
                          IPTR2(ICOUNT)=I                                                 RPRT     53
                    52    CONTINUE                                                      RPRT     54
                    53    DO 70 I1=1,ICOUNT                                             RPRT     55
     55                   I=ICOUNT+1-I1                                                  RPRT     56
                          I2=I-1                                                          RPRT     57
                          DO 70 J=1,I2                                                    RPRT     58
```

```
                INDEXA=IPTR2(J)                                                 RPRT      59
                INDEXB=IPTR2(J+1)                                               RPRT      60
60              IF(ORIG(INDEXA).LT.ORIG(INDEXB))GOTO 70                         RPRT      61
                IF(ORIG(INDEXA).NE.ORIG(INDEXB))GOTO 55                         RPRT      62
                IF(DSTN(INDEXA).LT.DSTN(INDEXB))GOTO 70                         RPRT      63
                IF(DSTN(INDEXA).NE.DSTN(INDEXB))GOTO 55                         RPRT      64
                IF(INAME(INDEXA).LE.INAME(INDEXB))GOTO 70                       RPRT      65
65          55  IPTR2(J)=INDEXB                                                RPRT      66
                IPTR2(J+1)=INDEXA                                               RPRT      67
            70  CONTINUE                                                        RPRT      68
                DO 80 I=2,ICOUNT                                                RPRT      69
                INDEXA=IPTR2(I-1)                                               RPRT      70
70              INDEXB=IPTR2(I)                                                 RPRT      71
                IF(ORIG(INDEXA).NE.10H           )TMPOR=ORIG(INDEXA)            RPRT      72
                IF(DSTN(INDEXA).NE.10H           )TMPOS=DSTN(INDEXA)            RPRT      73
                IF(ORIG(INDEXB).EQ.TMPOR)ORIG(INDEXB)=10H                       RPRT      74
                IF(DSTN(INDEXB).EQ.TMPOS.AND.ORIG(INDEXB).EQ.10H          )     RPRT      75
75              1 DSTN(INDEXB)=10H                                              RPRT      76
            80  CONTINUE                                                        RPRT      77
                ILINE=10                                                        RPRT      78
                PRINT 2100                                                      RPRT      79
            2000 FORMAT(1H1,25X,"AVS HISTORY FILE REPORT")                      RPRT      80
80              CALL DATRAN(DATE1,IDA1,IYR1,MNTH1)                              RPRT      81
                IF(DATE1.EQ.DATE2) GOTO 100                                     RPRT      82
                CALL DATRAN(DATE2,IDA2,IYR2,MNTH2)                              RPRT      83
                PRINT 2050,IDA1,MNTH1,IYR1,IDA2,MNTH2,IYR2                      RPRT      84
            2050 FORMAT(1H ,28X,I2,A3,I2," - ",I2,A3,I2)                        RPRT      85
85              GOTO 110                                                        RPRT      86
            100  PRINT 2100,IDA1,MNTH1,IYR1                                     RPRT      87
            2100 FORMAT(1H ,34X,I2,A3,I2)                                       RPRT      88
                 IF(SHIFT.EQ.0.) GOTO 110                                       RPRT      89
                 PRINT 2110,SHIFT                                               RPRT      90
90          2110 FORMAT(1H ,32X,"SHIFT-",F6.1)                                 RPRT      91
                 PRINT 2125                                                     RPRT      92
                 PRINT 2150                                                     RPRT      93
                 PRINT 2275                                                     RPRT      94
            2275 FORMAT(1H ,T18,"FROM",T27,"TO",T35,"NAME",T41,"REGULAR",T51,   RPRT      95
95              1"EMERGENCY",T63,"BACKLOG")                                     RPRT      96
                 PRINT 2295                                                     RPRT      97
            2295 FORMAT(1H ,T18,55(1H-))                                        RPRT      98
                 ILINE=11                                                       RPRT      99
                 GOTO 130                                                       RPRT     100
100         110  PRINT 2125                                                     RPRT     101
            2125 FORMAT(///,1H ,T46,"DELIVERIES")                               RPRT     102
                 PRINT 2150                                                     RPRT     103
            2150 FORMAT(1H ,T17,"WAREHOUSE NAME",T34,"TRUCK",T47,"(PALLETS)")   RPRT     104
                 PRINT 2175                                                     RPRT     105
105         2175 FORMAT(1H ,T18,"FROM",T27,"TO",T35,"NAME",T41,"REGULAR",T51,   RPRT     106
                1"EMERGENCY")                                                   RPRT     107
                 PRINT 2295                                                     RPRT     108
            2295 FORMAT(1H ,T18,55(1H-))                                        RPRT     109
            130  DO 120 I1=1,ICOUNT                                             RPRT     110
110             ILINE=ILINE+1                                                   RPRT     111
                IF(ILINE.LE.49)GOTO 105                                         RPRT     112
                ILINE=9                                                         RPRT     113
                PRINT3000                                                       RPRT     114
            3000 FORMAT(1H1)                                                    RPRT      15
```

```
   SUBROUTINE RPRT       74/74   OPT=0 ROUND=*/ TRACE          FTN 4.6+460        10/15/80  12.23.05

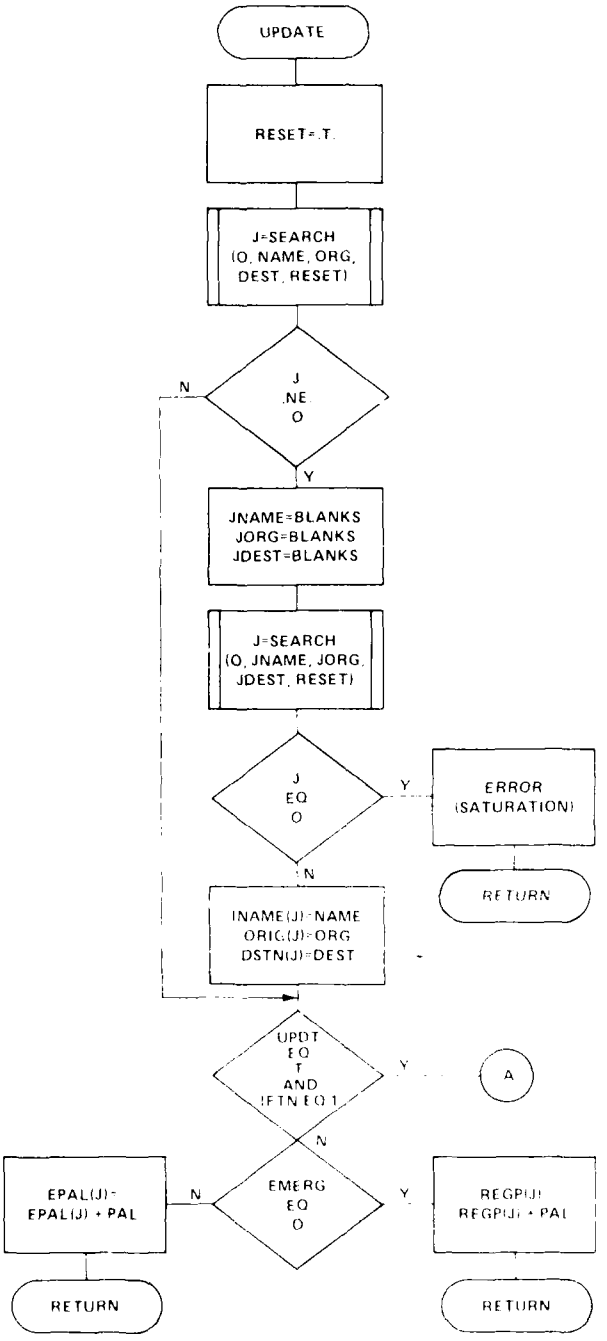
115                IF(SHIFT.EQ.0.) GOTO 140                                        RPRT      116
                   PRINT 2125                                                      RPRT      117
                   PRINT 2150                                                      RPRT      118
                   PRINT 2175                                                      RPRT      119
                   PRINT 2205                                                      RPRT      120
120                GOTO 135                                                        RPRT      121
              140  PRINT 2125                                                      RPRT      122
                   PRINT 2150                                                      RPRT      123
                   PRINT 2275                                                      RPRT      124
                   PRINT 2295                                                      RPRT      125
125           105  I=IPTR2(I1)                                                     RPRT      126
                   IF(ORIG(I).EQ.10H          )GOTO 115                            RPRT      127
                   PRINT 2225                                                      RPRT      128
              2225 FORMAT(1H )                                                     RPRT      129
                   ILINE=ILINE+1                                                   RPRT      130
130           115  IF(INAME(I).EQ.6HZZZZZ)GOTO 125                                 RPRT      131
                   PRINT 2200,ORIG(I),DSTN(I),INAME(I),REGP(I),EPAL(I)             RPRT      132
              2200 FORMAT(1H ,T17,A6,T25,A6,T35,A4,T43,I6,T53,I6)                  RPRT      133
                   GOTO 120                                                        RPRT      134
              125  PRINT 2500,ORIG(I),DSTN(I),REGP(I)                             RPRT      135
135           2500 FORMAT(1H ,T17,A6,T25,A6,T65,I6)                                RPRT      136
              120  CONTINUE                                                        RPRT      137
                   RETURN                                                          RPRT      138
              5000 CALL ERROR(30C)                                                 RPRT      139
                   END                                                             RPRT      140
```

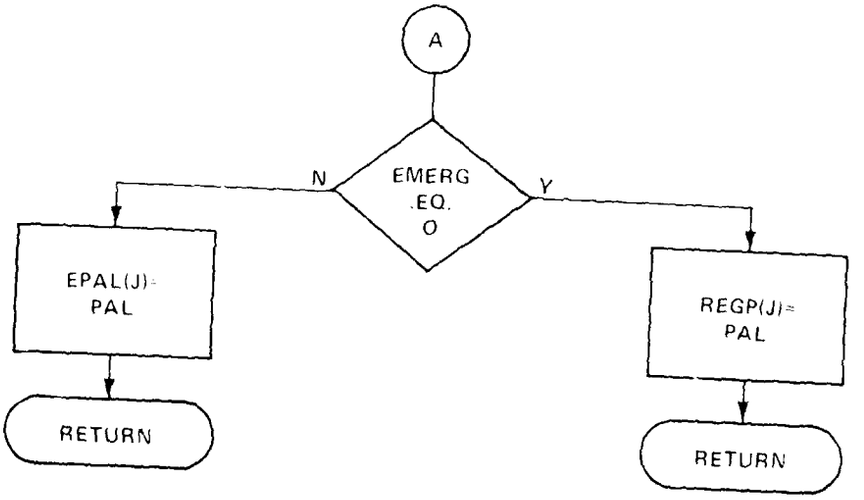

SEARCH
RESET .EQ. J.
Y
ICURS=1
N
.NOT. (JDATE.EQ. DATE.OR.JDATE EQ.0)
Y
CALL DTFND (JDATE)
N
B
.NOT. (JNAME.EQ. JNAME(ICURS).OR. JNAME.EQ. BLANKS)
Y
N
.NOT. (JORG.EQ. ORIG(ICURS).OR. JORG.EQ. BLANKS)
Y
N
.NOT. (JDEST.EQ. DSTN(ICURS).OR. JDEST.EQ. BLANKS)
Y
JNAME, JORG, & JDEST ALL BLANKS
N
Y
INAME (ICURS), ORIG (ICURS), & DSTN (ICURS) EQ BLANKS
Y
C
N
ICURS= ICURS+1
A


A
B
N
ICURS
.GT.
50
SEARCH=0
ICURS=1
RETURN
C
SEARCH=ICURS
ICURS=ICURS+1
ICURS
.GT.
50
Y
ICURS=1
RETURN

```
      FUNCTION SEARCH      7.7.74   OPT=2 ROUND=*/ TRACE          FTN 4.6+460          10/15/80  12.23.35

      1               INTEGER FUNCTION SEARCH(JDATE,JNAME,JORG,JDEST,RESET)                    SRCH      2
                    C ALPHANUMERICS                                                            SRCH      3
                      ALPHA JNAME,JORG,JDEST,NAME,ORG,DEST,INAME(50),ORIG(50),TRK,             SRCH      4
                     1 DSTN(50)                                                                SRCH      5
      5             C BINARY                                                                   SRCH      6
                      INTEGER D2                                                               SRCH      7
                      INTEGER DATE,YRMODA,JDATE,TDTE,PAL,EMERG,REGP(50),                       SRCH      8
                     1EPAL(50),ICURS                                                           SRCH      9
                      REAL ISHFT                                                               SRCH     10
     10               LOGICAL RESET                                                            SRCH     11
                      COMMON/AVSRC1/YRMODA,PAL,EMERG,IFTN                                      SRCH     12
                      COMMON/AVSRC2/SHFT                                                       SRCH     13
                      COMMON/AVSRC3/NAME,TRK,ORG,DEST                                          SRCH     14
                      COMMON/HISRC1/DATE,D2,IMARK,REGP,EPAL                                    SRCH     15
     15               COMMON/HISRC2/ISHFT                                                      SRCH     16
                      COMMON/HISRC3/INAME,ORIG,DSTN                                            SRCH     17
                      IF(RESET) ICURS=1                                                        SRCH     18
                      IF(.NOT.(JDATE.EQ.DATE.OR.JDATE.EQ.0)) CALL DTEND(JDATE)                 SRCH     19
                    5 IF(.NOT.(JNAME.EQ.INAME(ICURS).OR.JNAME.EQ.10H          ))GOTO 10      SRCH     20
     20               IF(.NOT.(JORG.EQ.ORIG(ICURS).OR.JORG.EQ.10H          ))GOTO 10         SRCH     21
                      IF(.NOT.(JDEST.EQ.DSTN(ICURS).OR.JDEST.EQ.10H          ))GOTO 10       SRCH     22
                    C THIS IS EITHER A HIT OR ALL BLANKS -CHECK FOR LATTER                     SRCH     23
                      IF(JNAME.EQ.10H          .AND.JORG.EQ.10H          .AND.               SRCH     24
                     1 JDEST.EQ.10H          ) GOTO 7                                          SRCH     25
     25               GOTO 20                                                                  SRCH     26
                    C IF INPUT IS NOT BLANKS, THIS IS A HIT-X-FER TO 20                        SRCH     27
                    7   IF(INAME(ICURS).EQ.10H          .AND.ORIG(ICURS).EQ.10H              SRCH     28
                     1 .AND.DSTN(ICURS).EQ.10H          )   GOTO 20                        SRCH     29
                          GOTO 10                                                              SRCH     30
     30             C IF THE TABLE LINE IS ALL BLANKS TOO, THIS IS A HIT- X-FER TO 20          SRCH     31
                    C OTHERWISE READ THE NEXT LINE IN THE TABLE                                SRCH     32
                    10    ICURS =ICURS+1                                                       SRCH     33
                          IF(ICURS.GT.50) GOTO 15                                              SRCH     34
                          GOTO 5                                                               SRCH     35
     35             15    SEARCH=0                                                             SRCH     36
                          ICURS=1                                                              SRCH     37
                          RETURN                                                               SRCH     38
                    20    SEARCH=ICURS                                                         SRCH     39
                          ICURS=ICURS+1                                                        SRCH     40
     40                   IF(ICURS.GT.50) ICURS=1                                              SRCH     41
                          RETURN                                                               SRCH     42
                          END                                                                  SRCH     43
```


UPDATE
RESET=.T.
J=SEARCH (O, NAME, ORG, DEST, RESET)
J .NE. O
N
Y
JNAME=BLANKS
JORG=BLANKS
JDEST=BLANKS
J=SEARCH (O, JNAME, JORG, JDEST, RESET)
J EQ O
Y
ERROR (SATURATION)
RETURN
N
INAME(J)=NAME
IORIG(J)=ORG
IDSTN(J)=DEST
UPDT EQ T AND IFTN EQ 1
Y
A
N
EMERG EQ O
N
EPAL(J)=EPAL(J) + PAL
RETURN
Y
REGPL(J)=REGPL(J) + PAL
RETURN


A
EMERG
.EQ.
0
N
Y
EPAL(J)=
PAL
RETURN
REGP(J)=
PAL
RETURN

```
SUBROUTINE UPDATE      74/74   OPT=0 ROUND=*/ TRACE          FTN 4.6+460        10/15/80  12.23.05

                                                                                UPDTE     2
1                       SUBROUTINE UPDATE                                       UPDTE     3
                  C ALPHANUMERIC                                                UPDTE     4
                        ALPHA JORG,JDEST,JNAME,NAME,ORG,DEST,INAME(50),ORIG(50),DSTN(50),  UPDTE     5
                       1 TRK                                                    UPDTE     6
                  C BINARY                                                      UPDTE     7
5                       INTEGER DATE,D2                                         UPDTE     8
                        INTEGER JDATE,EMERG,REGP(50),PAL,YRMODA,EPAL(50),DARRY(10),  UPDTE     9
                       1DEV1,DEV2,SEARCH                                        UPDTE    10
                        REAL ISHFT                                              UPDTE    11
10                      LOGICAL RESET,UPDTE,UPDT                                UPDTE    12
                        COMMON/AVSRC1/YRMODA,PAL,EMERG,IFTN                     UPDTE    13
                        COMMON/AVSRC2/SHFT                                      UPDTE    14
                        COMMON/AVSRC3/NAME,TRK,ORG,DEST                         UPDTE    15
                        COMMON/HISRC1/DATE,D2,IMARK,REGP,EPAL                   UPDTE    16
15                      COMMON/HISRC2/ISHFT                                     UPDTE    17
                        COMMON/HISRC3/INAME,ORIG,DSTN                           UPDTE    18
                        COMMON/CNTRL/UPDT,CARRY,DEV1,DEV2,UPDTE                 UPDTE    19
                        RESET=.T.                                               UPDTE    20
                        JDATE=D                                                 UPDTE    21
20                      JNAME=NAME                                              UPDTE    22
                        JORG=ORG                                                UPDTE    23
                        JDEST=DEST                                              UPDTE    24
                        J=SEARCH(JDATE,JNAME,JORG,JDEST,RESET)                  UPDTE    25
                        IF (J.NE.0) GOTO 10                                     UPDTE    26
25                C FIND NEXT BLANK AREA IN TABLE                               UPDTE    27
                        JNAME=1HH                                               UPDTE    28
                        JORG=1HH                                                UPDTE    29
                        JDEST=1HH                                               UPDTE    30
                        J=SEARCH(JDATE,JNAME,JORG,JDEST,RESET)                  UPDTE    31
30                      IF(J.NE.0) GOTO 5                                       UPDTE    32
                        PRINT 1000,PAL,JORG,JDEST,JNAME                         UPDTE    33
                     1000 FORMAT(1H ,"TABLE SATURATION-FOLLOWING NOT INCLUDED",/,  UPDTE    34
                       1 1H ,I6," PALLETS FROM ",A6," TO ",A6," VIA ",A4)       UPDTE    35
                        RETURN                                                  UPDTE    36
35                   5  INAME(J)=NAME                                          UPDTE    37
                        ORIG(J)=ORG                                             UPDTE    38
                        DSTN(J)=DEST                                            UPDTE    39
                     10 IF(UPDT AND.IFTN.EQ.1) GOTO 40                          UPDTE    40
                        IF(EMERG.EQ.0) GOTO 20                                  UPDTE    41
40                      EPAL(J)=EPAL(J)+PAL                                     UPDTE    42
                        UPDTE=.T.                                               UPDTE    43
                        RETURN                                                  UPDTE    44
                     20 REGP(J)=REGP(J)+PAL                                     UPDTE    45
                        UPDTE=.T.                                               UPDTE    46
45                      RETURN                                                  UPDTE    47
                     40 IF(EMERG.EQ.0) GOTO 50                                  UPDTE    48
                        EPAL(J)=PAL                                             UPDTE    49
                        UPDTE=.T.                                               UPDTE    50
                        RETURN                                                  UPDTE    51
55                   50 REGP(J)=PAL                                             UPDTE    52
                        UPDTE=.T.                                               UPDTE    53
                        RETURN                                                  UPDTE    54
                        END
```

APPENDIX E - SAMPLE RUNS

SAMPLE - AVS1 RUN, REGULAR ORDERS

AVS REGULAR ORDER PROGRAM

10/20/80

800.0

(OPT=0)

ORDERS

1	10	PALLETS	FROM SM	TO NWS
2	6	PALLETS	FROM 1605	TO NWS
3	5	PALLETS	FROM 23	TO NWS
4	8	PALLETS	FROM 1	TO NWS
5	12	PALLETS	FROM 1	TO NWS
6	6	PALLETS	FROM 1172	TO 198
7	6	PALLETS	FROM 198	TO 1172
8	12	PALLETS	FROM 64W	TO 198
9	10	PALLETS	FROM 64W	TO 224
10	11	PALLETS	FROM 64W	TO X10
11	12	PALLETS	FROM 64W	TO 1606
12	3	PALLETS	FROM 67E	TO 224
13	11	PALLETS	FROM 67E	TO SM
14	10	PALLETS	FROM 67E	TO X10
15	1	PALLETS	FROM 67E	TO 1E
16	1	PALLETS	FROM 67E	TO 23
17	1	PALLETS	FROM 67E	TO 61
18	1	PALLETS	FROM 67E	TO 647
19	1	PALLETS	FROM 67E	TO 1
20	8	PALLETS	FROM 67E	TO 1E21
21	1	PALLETS	FROM 67E	TO 49
22	1	PALLETS	FROM 67E	TO 64
23	11	PALLETS	FROM 1604	TO 224
24	11	PALLETS	FROM 1604	TO 647
25	11	PALLETS	FROM 1604	TO 23
26	1	PALLETS	FROM 1604	TO 1
27	11	PALLETS	FROM 1603	TO 1172
28	11	PALLETS	FROM 1603	TO 1605
29	11	PALLETS	FROM 1603	TO 1503
30	11	PALLETS	FROM 1603	TO 1138
31	5	PALLETS	FROM 1603	TO 1606
32	1	PALLETS	FROM 191	TO 224
33	1	PALLETS	FROM 191	TO X10
34	2	PALLETS	FROM 191	TO 23
35	2	PALLETS	FROM 1502	TO 1E21
36	7	PALLETS	FROM 1502	TO 224
37	3	PALLETS	FROM 1605	TO 224
38	11	PALLETS	FROM 1605	TO SM
39	3	PALLETS	FROM 1605	TO 1606
40	11	PALLETS	FROM 1605	TO X10
41	1	PALLETS	FROM 1605	TO 23
42	1	PALLETS	FROM 1605	TO 647

```
43      1 PALLETS FROM 1602    TO 1021
44      2 PALLETS FROM 1602    TO 224
45      7 PALLETS FROM 1602    TO SM
46      1 PALLETS FROM 1602    TO 23
47      1 PALLETS FROM 1602    TO 646
48      2 PALLETS FROM 1602    TO 647
49     30 PALLETS FROM 1602    TO 1507
50      1 PALLETS FROM 66E     TO 1503
51     10 PALLETS FROM 66E     TO 191
52      1 PALLETS FROM 66E     TO 224
53      1 PALLETS FROM 66E     TO SM
54      1 PALLETS FROM 66E     TO X10
55     10 PALLETS FROM 1604    TO 647
56      2 PALLETS FROM 1604    TO 224
57      1 PALLETS FROM SM      TO 1172
58      1 PALLETS FROM 67W     TO SM

                ----------------
                VEHICLES SELECTED
                ----------------

1 VEHICLE ST 1 CAPACITY =   7 PALLETS, ROUTE DURATION =  240.0 MINS.
2 VEHICLE ST 2 CAPACITY =   7 PALLETS, ROUTE DURATION =  240.0 MINS.
3 VEHICLE ST 3 CAPACITY =   7 PALLETS, ROUTE DURATION =  240.0 MINS.
4 VEHICLE TR 1 CAPACITY =  12 PALLETS, ROUTE DURATION =  240.0 MINS.
5 VEHICLE TT 1 CAPACITY =  14 PALLETS, ROUTE DURATION =  240.0 MINS.


6 VEHICLE IT 1 CAPACITY =  10 PALLETS, ROUTE DURATION =  240.0 MINS.
7 VEHICLE IT 2 CAPACITY =  10 PALLETS, ROUTE DURATION =  240.0 MINS.
```

VEHICLE - ST 1
START TIME - 800.
DATE 102080

STOP	SITE	TIME	DELIVER	PICK UP	ORDER	STAY TIME
1	1602	809		7 PALLETS	45	3
2	SM	814	7 PALLETS		45	3
3	1602	823		7 PALLETS	36	3
4	224	838	7 PALLETS		36	3
5	60E	853		1 PALLETS	54	2
				1 PALLETS	52	1
6	67E	857		3 PALLETS	12	3
7	X10	911	1 PALLETS		54	2
8	224	915	1 PALLETS		52	2
			3 PALLETS		12	1
9	1003	941		5 PALLETS	31	3
10	1606	1006	5 PALLETS		31	3
11	1004	1011		2 PALLETS	56	2
12	1002	1015		2 PALLETS	44	2
13	191	1019		1 PALLETS	32	2
14	224	1044	2 PALLETS		56	2
			2 PALLETS		44	1
			1 PALLETS		32	1
15	191	1110		2 PALLETS	34	2
16	1602	1114		1 PALLETS	46	2
17	23	1143	2 PALLETS		34	2
			1 PALLETS		46	1

ROUTE ENDED
LOCATION =1079
TIME = 1211
NO OF PALLETS MOVED = 32

VEHICLE - ST 2
START TIME - 800.
DATE 102080

STOP	SITE	TIME	DELIVER	PICK UP	ORDER	STAY TIME
1	1602	809		7 PALLETS	49	3 *SPLIT
2	1507	818	7 PALLETS		49	3 *SPLIT
3	1602	834		7 PALLETS	49	3 *SPLIT
4	1507	839	7 PALLETS		49	3 *SPLIT
5	1602	855		7 PALLETS	49	3 *SPLIT
6	1507	900	7 PALLETS		49	3 *SPLIT
7	1602	916		7 PALLETS	49	3 *SPLIT
8	1507	921	7 PALLETS		49	3 *SPLIT
9	1604	937		7 PALLETS	23	3 *SPLIT
10	224	1000	7 PALLETS		23	3 *SPLIT
11	1604	1026		4 PALLETS	23	3 *SPLIT
12	224	1031	4 PALLETS		23	3 *SPLIT

ROUTE ENDED
LOCATION =1078
TIME = 1042
NO OF PALLETS MOVED = 39

VEHICLE - ST 3
START TIME - 800.
DATE 102080

STOP	SITE	TIME	DELIVER	PICK UP	ORDER	STAY TIME
1	1604	809		7 PALLETS	25	3 *SPLIT
2	23	836	7 PALLETS		25	3 *SPLIT
3	1604	908		4 PALLETS	25	3 *SPLIT
4	23	912	4 PALLETS		25	3 *SPLIT
5	1604	942		7 PALLETS	24	3 *SPLIT
6	647	953	7 PALLETS		24	3 *SPLIT
7	1604	1026		4 PALLETS	24	3 *SPLIT
8	647	1039	4 PALLETS		24	3 *SPLIT

ROUTE ENDED
LOCATION =1078
TIME = 1053
NO OF PALLETS MOVED = 22

VEHICLE - TR 1
START TIME - 800.
DATE 102080

STOP	SITE	TIME	DELIVER	PICK UP	ORDER	STAY TIME
1	64W	802		12 PALLETS	6	12
2	198	815	12 PALLETS		6	12
3	64W	828		12 PALLETS	11	12
4	1606	846	12 PALLETS		11	12
5	1603	900		11 PALLETS	28	11
6	1605	912	11 PALLETS		28	11
				11 PALLETS	36	9
7	SM	936	11 PALLETS		38	11
8	67E	951		11 PALLETS	13	11
9	66E	1003		1 PALLETS	53	3
10	SM	1008	1 PALLETS		53	3
			11 PALLETS		13	9
11	64W	1021		11 PALLETS	10	11
12	X10	1042	11 PALLETS		10	11
13	1603	1113		11 PALLETS	30	11
14	1138	1134	11 PALLETS		30	11
15	1603	1151		11 PALLETS	29	11
16	1503	1213	11 PALLETS		29	11

ROUTE ENDED
LOCATION =1078
TIME = 1227
NO OF PALLETS MOVED = 91

VEHICLE - TT 1
START TIME - 800.
DATE 102080

STOP	SITE	TIME	DELIVER	PICK UP	ORDER	STAY TIME
1	SM	802		10 PALLETS	1	22
2	NWS	909	10 PALLETS		1	22
3	1605	1016		6 PALLETS	2	16
4	1	1053		8 PALLETS	4	19
5	NWS	1156	8 PALLETS		4	19
			6 PALLETS		2	11

ROUTE ENDED
LOCATION =1078
TIME = 1310
NO OF PALLETS MOVED = 24

VEHICLE - IT 1
START TIME - 800.
DATE 102080

STOP	SITE	TIME	DELIVER	PICK UP	ORDER	STAY TIME
1	66E	802		10 PALLETS	51	22
2	191	833	10 PALLETS		51	22
3	1604	857		10 PALLETS	55	22
4	647	949	10 PALLETS		55	22
5	64M	1031		10 PALLETS	9	22
6	224	1102	10 PALLETS		9	22
7	67E	1136		10 PALLETS	14	22
8	X10	1210	10 PALLETS		14	22

ROUTE ENDED
LOCATION =1074
TIME = 1244
NO OF PALLETS MOVED = 40

VEHICLE - IT 2
START TIME - 800.
DATE 102080

STOP	SITE	TIME	DELIVER	PICK UP	ORDER	STAY TIME	
1	67E	802		8 PALLETS	20	19	
2	1621	829	8 PALLETS		20	19	
3	1605	850		3 PALLETS	37	10	
4	191	902		1 PALLETS	33	7	
5	1602	910		1 PALLETS	47	7	
				2 PALLETS	48	4	
6	1605	923		1 PALLETS	42	7	
7	647	959	1 PALLETS		42	7	
			2 PALLETS		48	4	
8	646	1011	1 PALLETS		47	7	
9	X10	1027	1 PALLETS		33	7	
10	224	1036	3 PALLETS		37	10	
11	1605	1109		10 PALLETS	40	22	*SPLIT
12	X10	1154	10 PALLETS		40	22	*SPLIT

ROUTE ENDED
LOCATION =1078
TIME = 1226
NO OF PALLETS MOVED = 26

```
**************************************************
    ORDERS NOT MOVED
**************************************************


ORDER   -49.   2FROM ,1602    TO 1507
ORDER    27.  11FROM ,1603    TO 1172
ORDER    26.   1FROM ,1604    TO 1
ORDER    39.   3FROM ,1605    TO 1636
ORDER    43.   1FROM ,1605    TO 1621
ORDER   -46.   1FROM ,1605    TO X1
ORDER    41.   1FROM ,1605    TO 23
ORDER    50.   1FROM ,067E    TO 1503
ORDER    21.   1FROM ,67E     TO 45
ORDER    17.   1FROM ,67E     TO 61
ORDER    22.   1FROM ,67E     TO 64
ORDER    16.   1FROM ,67E     TO 647
ORDER    19.   1FROM ,67E     TO 1
ORDER    15.   1FROM ,67E     TO 16
ORDER    16.   1FROM ,67E     TO 23
ORDER    50.   1FROM ,67W     TO SM
ORDER     7.   6FROM ,198     TO 1172
ORDER    57.   1FROM ,SM      TO 1172
ORDER    35.   2FROM ,1502    TO 1621
ORDER     6.   6FROM ,1172    TO 198
ORDER     5.  12FROM ,1       TO NWS
ORDER     3.   5FROM ,23      TO NWS
```

SAMPLE - AVS2 RUN, SPECIAL ORDERS

AD-A095 729 DAVID W TAYLOR NAVAL SHIP RESEARCH AND DEVELOPMENT CE--ETC F/G 12/2
AUTOMATIC VEHICLE SCHEDULING (AVS) PROGRAMMER'S INSTRUCTION MAN--ETC(U)
FEB 81 R WINCHELL, R MELTON, M NATRELLA

UNCLASSIFIED DTNSRDC-81/017 NL

3 OF 3

END
DATE FILMED
3-81
DTIC

```
-------------------------
 AVS SPECIAL ORDER PROGRAM
-------------------------


          10/20/80

            800.0

          ------
          ORDERS
          ------

    1   14 PALLETS FROM 67E     TO NHS
    2   10 PALLETS FROM 67E     TO SM
    3   14 PALLETS FROM 67E     TO 1601A

SPECIAL ORDER TIME =   900.

BUMP OPTION = NO


          -----------------
          VEHICLES SELECTED
          -----------------

1 VEHICLE ST 4 CAPACITY =   7 PALLETS. ROUTE DURATION =  240.0 MINS.
2 VEHICLE ST 5 CAPACITY =   7 PALLETS. ROUTE DURATION =  240.0 MINS.
3 VEHICLE TT 2 CAPACITY =  14 PALLETS. ROUTE DURATION =  240.0 MINS.
```

VEHICLE - ST 4
START TIME - 800.
DATE 102080

STOP	SITE	TIME	DELIVER	PICK UP	ORDER	STAY TIME
1	67E	902		7 PALLETS	2	3 *SPCL*
2	SM	907	7 PALLETS		2	3 *SPCL*
3	67E	912		3 PALLETS	2	3 *SPCL*
4	SM	916	3 PALLETS		2	3 *SPCL*
5	67E	920		7 PALLETS	3	3 *SPCL*
6	1601A	932	7 PALLETS		3	3 *SPCL*
7	67E	944		7 PALLETS	3	3 *SPCL*
8	1601A	950	7 PALLETS		3	3 *SPCL*

ROUTE ENDED
LOCATION =107N
TIME = 1002
NO OF PALLETS MOVED = 24

VEHICLE - TT 2
START TIME - 800.
DATE 102080

STOP	SITE	TIME	DELIVER	PICK UP	ORDER	STAY TIME	
1	67E	902		14 PALLETS	1	29	*SPCL*
2	NWS	1015	14 PALLETS		1	29	*SPCL*
3	1	1129		12 PALLETS	5	26	
4	NWS	1239	12 PALLETS		5	26	

ROUTE ENDED
LOCATION =107A
TIME = 1350
NO OF PALLETS MOVED = 26

****

ORDERS NOT MOVED

****

```
ORDER   -49.  2FROM ,1E02    TO 1507
ORDER    27. 11FROM ,1E03    TO 1172
ORDER    2E.  1FROM ,1604    TO 1
ORDER    39.  3FROM ,1E05    TO 1606
ORDER    43.  1FROM ,1605    TO 1621
ORDER   -4E.  1FROM ,1E05    TO X10
ORDER    41.  1FROM ,1E05    TO 23
ORDER    5E.  1FROM ,66E     TO 1503
ORDER    21.  1FROM ,67E     TO 49
ORDER    17.  1FROM ,57E     TO 61
ORDER    22.  1FROM ,67E     TO 84
ORDER    18.  1FROM ,57E     TO 647
ORDER    19.  1FROM ,67E     TO 1
ORDER    15.  1FROM ,67E     TO 16
ORDER    16.  1FROM ,67E     TO 23
ORDER    58.  1FROM ,67W     TO SM
ORDER     7.  6FROM ,198     TO 1172
ORDER    57.  1FROM ,SM      TO 1172
ORDER    35.  2FROM ,1502    TO 1621
ORDER     6.  6FROM ,1172    TO 198
ORDER     3.  5FROM ,23      TO NWS
```

SAMPLE - HISTORY FILE UPDATE RUN

AVS HISTORY FILE REPORT
26JUN79
SHIFT- 745.0

WAREHOUSE FROM	NAME TO	TRUCK NAME	DELIVERIES (PALLETS) REGULAR	EMERGENCY	BACKLOG
1138	ABASE				12
	DEYTN	TT2	14	0	
		TT3	14	0	
					12
	64F	ST1	12	0	
193	1601B	TT1	23	0	
198	1138	ST1	12	0	
	1601A	ST1	5	0	
		ST2	7	0	
	1605	TR1	30	0	
45	DEYTN				23
	1138	ST2	24	0	
	193	TT1	14	0	
		TT2	9	0	
	64W	ST1	88	1	
		ST2	5	0	

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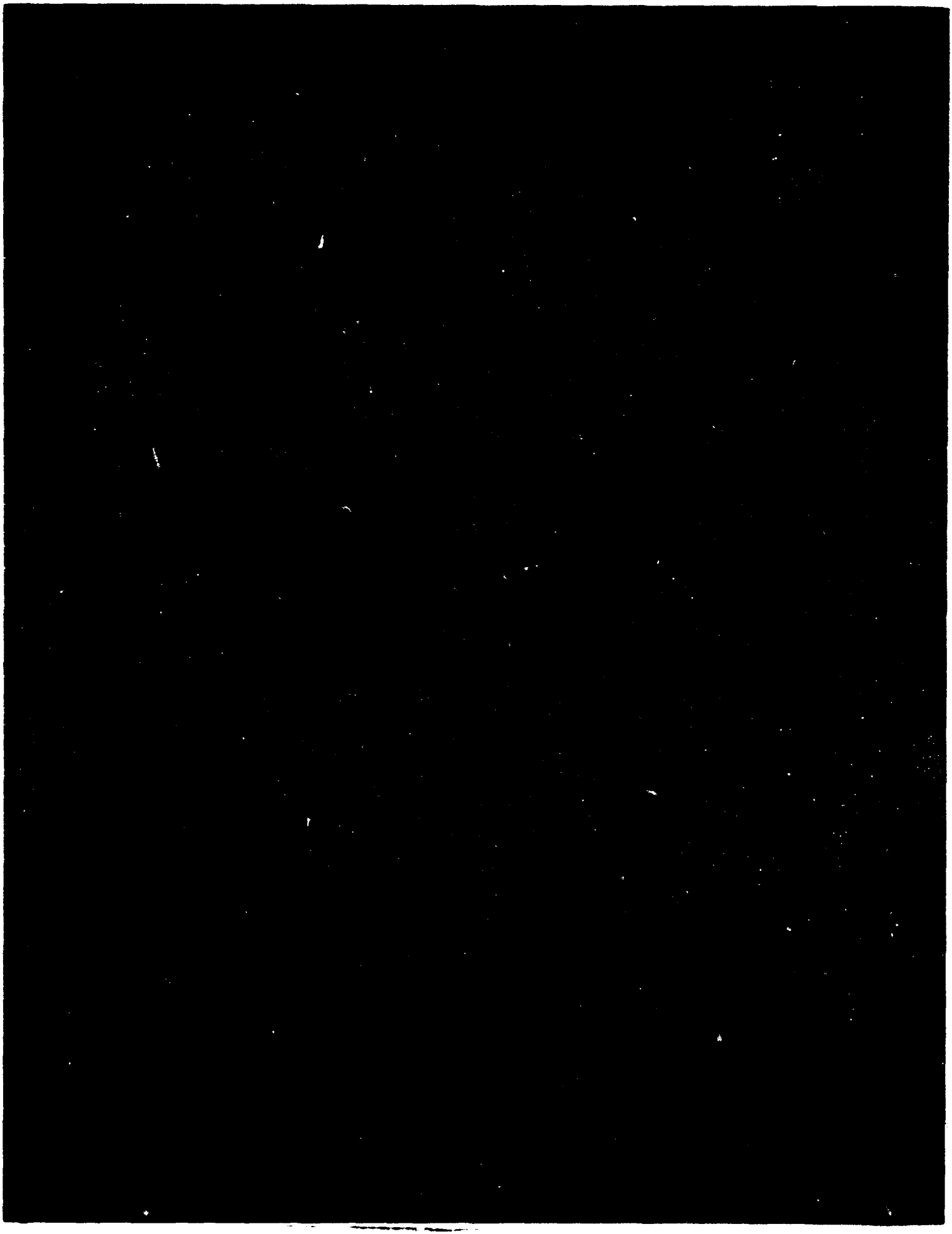

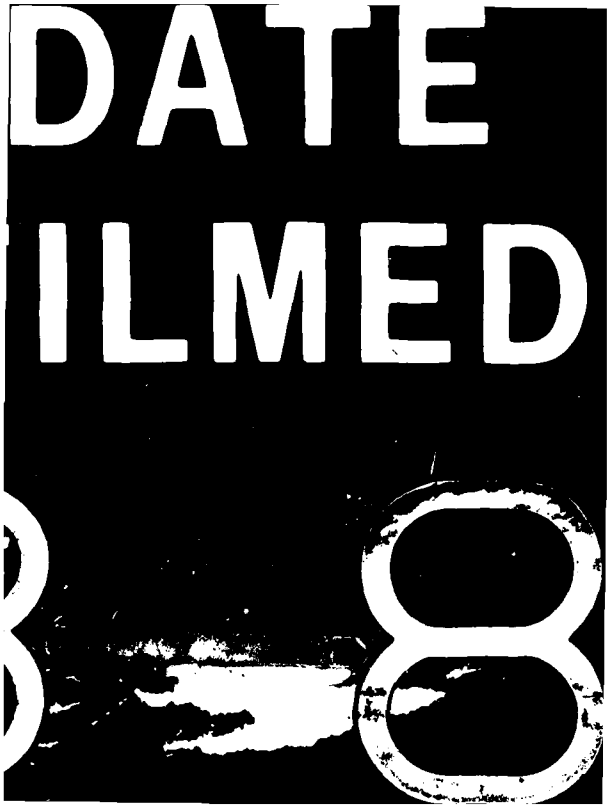
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